MINING & PETROLEUM STANDARD

AND

American Gas-Light Journal.

Rooms 27 and 28—No. 15 Nassau Street, corner of Pine Street, New York.

VOL. VI.—No. 8—WHOLE No. 116. NEW YORK, MONDAY, OCT. 17, 1864. $3 PER ANNUM—IN ADVANCE.

PETROLEUM.

PETROLEUM AS FUEL.

The London *Oil Trade Review* publishes the following:—Being engaged in perfecting a method for burning petroleum as steam fuel on a very simple principle, using for the purpose an extremely small apparatus, for which I have taken out both English and foreign patents, I read carefully over the late articles that have appeared in your paper relative to the subject.

The impression gained from them, especially that of the 6th August, is, that it was our common coal that was used against petroleum, by the Commission appointed by the American Government to examine and report on the subject, and likewise by Professor Fisher, of New Haven, and that 198 gallons of the oil were found to have only the same heating powers as 2000 lbs. of coal. Premising that I believe the processes upon which the experiments were made wasted half the oil, it was not our common coal that was used, but anthracite coal, one akin to petroleum. Its effect as a fuel is the rapid production of an intense heat, confined to a surface not extending more than a few inches above the bars, and acting in that way, is, I believe, much more powerful than the English coal. It is commonly used in New York; the Americans understand it, we do not. The price of the Welsh anthracite coal is 1*l.* 7*s.* per ton in London, and that is not so good as the American.

Professor Fisher's experiments were carried out only on a small scale. To fully settle the comparative value of the oil against coal, an oil-burning apparatus should be kept in full operation for eight or ten hours, under the boiler of an engine of at least six-horse power.

The statement relative to the Persia steam vessel is to be found in the report of the American Commissioners. Now, our cousins are very cute calculators. I should long hesitate to put aside as worthless anything they brought forward on such a subject, especially if it was with the sanction of the head engineer of the American Navy. But, Sir, admitting that for all common purposes the present price of petroleum renders it incapable of competing with coal as steam fuel, there are many items which add to the price of coal for a great ocean steamer which must be taken into consideration. The first price here is a very small part of the matter. It is a subject of great importance, and should not lightly be slurred over. The yearly yield, or take, from our coal-fields is 90,000,000 tons. The exportation of coals from this country amounted in 1862 to 7,671,670 tons. Of this quantity, probably 100,000*l.* worth were sent by our Government alone for the use of the steamships in China, and the India Seas. Our great steamship companies send their portion. There is the expense of carriage, the establishing and keeping up coaling stations, offices, clerks, servants, *et genus omne*.

Stopping for coals causes great delay; vessels are compelled to deviate widely from the best tracts to the necessary coaling stations. Steamships sometimes lose from twelve to twenty days in this manner. Coals obtained on the India and Australia route cost on the average from four to five times per ton as much as in this country.

The oil is more distributed throughout the world than coal. There are stations where the prices of oil and coal are reversed, the oil being the cheapest. There are large ocean tracts where coal cannot be procured at all, but where probably oil abounds, where our steamers at present are never seen—at least, they are certainly able to supply themselves from the cheapest market, without depending upon England for the supply.

Against coal must be placed the army of stokers required, the injury done the engines, the waste of fuel in the heavy smoke, and the great space lost for merchandise by the size of the coal bunkers.

On the sea, the great the open sea, what is the position of steam at present? Why, it is an auxiliary to sails merely. The fires are lighted when there is no wind. As soon as a favorable breeze springs up they are extinguished, so bulky, and therefore so costly, are the coals.

All this, Sir, must be considered when we calculate the expense of coals for steam navigation, but there is something more. If steam was the principle, and sails the auxiliary, a ship could leave England with a rig at present seen only on vessels navigating along our own coast. There would be nearly the whole expense of masts, sails, rigging, &c., saved; there would be fewer shipwrecks, no men lost off the yards while furling sails in tempestuous weather; fewer sailors engaged in each ship, but more vessels sent to sea. On our men-of-war the chief duty of our sailors would be to attend to their guns, no longer the mild weapons of former times. Ships could make short direct passages without turning aside for fuel, time would be saved, and labour, more costly than the most expensive fuel, reduced in cost.

I firmly believe that petroleum will be the means of thus fully developing steam navigation. It certainly is the proper steam-fuel. It can be kept in one constant flame, without slack, the heat taken to the boiler, the grate kept cool, an excess of oxygen admitted between the bars.

The apparatus I wish to introduce is in the form of a moveable grate, that could be wheeled under any engine, the coal-grate being temporarily removed, enabling the engine to burn either coal or Petroleum, as desired; the latter without waste, and so completely under command that, if there were a dozen furnaces on board a ship, all the grates could be supplied with oil at one operation by the engineer, sitting at his table away from the engine-room. It would burn its own smoke, and heat the feed-water for the engine.

To prevent the too quick exhaustion of our coal fields, by any means, would be effecting a national service. Projectors endeavoring to use petroleum for the purpose should not be told "that its introduction as a fuel is one of the wildest dreams that was ever conceived." It is not so. Parties who look to the use of petroleum as fuel should have souls above calculating the results for a Gravesend packet. They should take enlarged views, and they may rest assured that, however large such views may be, petroleum will be found fully capable of meeting them. I am, &c.,

C. J. RICHARDSON.

PETROLEUM SPRINGS OF THE UNITED STATES.

Among the number of natural productions adapted to the manufacture of oils within the limits of the United States, none appear at present to be of greater value than the Petroleum of the coal region. The "Seneca or Genesee oil" has long been known, collected, and employed for medicinal purposes. It occurs in the State of New York, at Cuba, Cayuga Lake, in Cataraugus County, Syracuse, and other places. At Fredonia, in Chatauque County, natural jets of carburetted hydrogen issue from the earth. The gas is collected in gasometers, and employed for lighting houses. Similar streams of gas have been found at other localities. These gas jets are evidently connected with the naphthalous springs, and are the result of decomposing agencies going forward in the earth.

It has been already stated that the Alleghany bituminous coal field occupies an area of 63,000 square miles. The number of those square miles in each of eight different States has been set down in the following manner:

No.	States.	Area of States. Square Miles.	Area of Bituminous Coal Strata therein.
1	Alabama.	51,770	4,300
2	Georgia.	58,000	150
3	Tennessee.	45,000	4,300
4	Kentucky.	40,500	9,000
5	Virginia.	64,000	21,000
6	Maryland.	13,950	550
7	Ohio.	44,400	11,900
8	Pennsylvania.	47,000	15,000
	Total.	364,620	66,200

At numerous places, and throughout almost the whole extent of this coal region, reservoirs of petroleum, deep in the earth, and springs of the oil have been found to exist, and frequently associated with salt water, and doubtless salt itself.

The original manufacture of kerosene, for which the New York Kerosene Gas Light Company, was followed by the manufacture of "coal oil." The celebrity the oil has obtained for illumination has led many to examine the earth, not only for coals, but for every mineral that will afford oil by distillation. The result has been remarkable. In some instances the boring made for salt water have give vent to petroleum in large supplies. In places where there have been indications of the mineral oil at the surface, the earth's crust has been perforated, and the petroleum is now pumped up, and constantly flowing from its deep subterranean cisterns. What is the value, it may be asked, of 63,000 square miles of country which yields coal, iron, oil, and salt beneath its fertile soil? Here are the elements of strength, heat, light, food, and the giant steam opened at once to the science, skill, and untiring energy of an enterprising people.

Mineral oil, or petroleum, was known to the ancients, and employed by them for various purposes. Herodotous treats of the wells of Zakanthus, now called Zante, which still yield bitumen. Plutarch describes the spectacle of a sea on fire, or lake of inflamed petroleum, near Ecbatana. The perpetual fires that burned at the Pagan shrines are supposed to have been pro-

duced by springs of mineral oil inflamed at the surface. The springs of the United States were known to, and the oils used by the now dispersed tribes of Indians. Between the mouth of Oil Creek and Titusville, Penn., old vats are to be seen, and trees are now growing upon the earth thrown out in the sinking of pits to collect the naphtha of the surface. At the present times the principal borings for oil are in Pennsylvania, Virginia, and Ohio. Explorations, and the sinking of pipes, have been commenced in Alabama, Georgia, Tennessee, Kentucky, and Maryland. The average depth at which oil is obtained has not yet far exceeded two hundred and fifty feet. Deeper sinkings may hereafter be found profitable. Carburetted hydrogen gas frequently escapes from the pipe when it is first let down into the earth, and sometimes salt water rises with the oil. Accurate records have not been kept of all the strata penetrated: but they appear to consist chiefly of limestone, sandstone, and shale. At the present time upwards of five hundred and fifty wells have been opened, or the borings are in progress. From the wells to which pumps had been applied, twenty-five thousand gallons of crude oil are raised daily, and the quantity is rapidly increasing. Before this report can go before the public, it is quite safe to state that the daily supply of petroleum will amount to thirty thousand gallons per-day, for the supply of lamps, and to relieve the friction of machinery. The introduction of kerosene into the United States gave rise to poetical descriptions of the long and lasting holiday the whales of the sea would enjoy from the substitution of oil from coals for oils from animals. It now appears that the dreams of those who advocated peace with the marine mammalia are to be realized. The purified petroleums not only afford liquid oils, but also the solid paraffines, which, for candles, exceeds in beauty, and equals in light, the pure sperm taken from the heads of the finny monster at sea. —*Phia. Coal Oil Circular.*

FACTS CONCERNING THE OIL WELLS.

The interference of one oil well with another, is becoming a common occurrence upon Oil creek. It is, to say the least, very vexatious to the lucky owner of a flowing or pumping well, who has labored day and night, expended the earnings of years of toil and self denial, and just when he is on the highway to bound less wealth, to have his hopes crushed in a few hours, by the striking of a well near his own, that taps it, and turns his golden dreams of wealth into limpid, valueless water. Notwithstanding the great disappointment consequent upon a disaster of this kind, the true operator takes it cooly. He well knows, that no effort or foresight of his can remedy the matter, and so, if he fails to effect a compromise, or sell out, he seeks another location, and very frequently interferes with some one else in like manner.

It would seem, in the minds of many, to be a settled fact, that any flowing or pumping well can be tapped or deprived of its supply, by boring another well upon some particular side of it. As to which side or in what direction that is, we are not clearly informed. No one, as yet, has satisfactorily ascertained the exact bearings of the oil veins.

We might give the opinions of some who profess to know the exact directions in which an oil vein is located, but we consider it no part of our duty as a truthful journalist to theorize just at the present, but to give the facts as they occur, so that the intelligent reader can form his own conclusions. If the operator an get the exact bearings of the oil vein, to tap or interfere with any well, is an easy matter. But we are of opinion that too many exceptions have occured to render this general received theory or hypothesis, a fixed fact. We will proceed to give a few cases in point.

Upon the M'Ilhenny farm, in the same locality, there were some nineteen wells. But few or any of these interfered with each other. All of them produced more or less oil. Finally, a well, the Olmstead, was bored almost in the centre of these. The consequence has been, the stoppage of all these wells, and the Olmstead at one time, not long since, flowed 300 barrels of oil per day. How much it is producing at present, we are not advised, but suppose it don't vary greatly from that amount.

Upon the Blood farm, a well has been bored adjoining the Duncan well, in such close proximity that the bottom of the derricks touch each other, in fact the two wells are not over twelve feet distant. The new well has not only failed to get any considerable quantity of oil, but has not succeeded in tapping the Duncan, though it has been sunk several feet deeper. The owner's of the Duncan well, doubtless feel rejoiced at this contradiction of the accepted theory.

In the case of the Phillips and Woodford wells, when both are tubed, the Phillips well runs pure oil, while the oil from the Woodford is "rily" or mixed with about forty per cent of water. These two wells are located only a few yards apart in an almost direct line.

The Hammond well, on the widow M'Clintock farm, is surrounded by wells in every direction. Yet at the commencement, it flowed at the rate of between five and six hundred barrels of oil per day. A strong stream of water, from what direction, has never been fully ascertained, literally drowned it out, and it ceased flowing after yielding its greasy treasure in such copious abundance for a short time. But strangely enough, the latest advices from this well, represent that the pump is rapidly gaining upon the water, oil has come up in the proportion of about one-third, there is a good show of gas, and the indications are that this well will soon approximate, if not exceed its former supply. Such is the reward of perseverance.

The cases we have mentioned are aggravated ones. Some of these occurring from the reason that parties had leased wells, or operating the wells already bored, with the intent of tapping or interfering with them, in order to be enabled to levy black mail.

How all this loss to individuals and injury to the general trade could have been avoided, had the parties felt disposed to exercise toward each other a more compromising and Christian feeling, the reader can imagine. But then, the sole object of many men here, as elsewhere, is to make money, and too many think the end justifies the means. The necessity of some legislative enactments, to effectually remedy this matter, if such a thing be possible, is keenly felt, and we trust that measures will be taken to check this cut throat operation. We see no reason why the law should not protect the man's property from injury by his neighbor, as much in an oil well, as in anything else.

The instances above, we have only cited to show how utterly useless it is to attempt to theorise upon a matter which only the great Chemist of the Universe knows the causes and effects.—*Oil City Register.*

Decrease of Petroleum Imported into Englamd.—We cut the subjoined from the London *Colliery Guardian* of September 3:

"*The Subsidence of Petroleum.*—The Liverpool correspondent of the Reporter says:—'It would appear as if those who made such an outcry some time ago against petroleum, on the ground of the injury inflicted by it on the olfactory nerves of Her Majesty's subjects, were likely to be relieved of any further trouble in the matter. If the quantity imported continues to decrease as it has lately done there will be no necessity for either civic or parliamentary interference to remove the "nuisance,' for it will speedily extinguish itself. During the first half of 1863, 21,061 tons were imported, but the quantity imported during the correspon ing period of 1864 was only 5,652 tons. And in the month of June the imports were only 883 tons against 5,391 in the same month of last year. This extraordinary falling off is attributed to the diminution in the supplies from the United States, only 4,000 tons having been received from the quarter from January to June, 1864, against 20,000 for the same period of last year. The difference in the value of the importations in about £165,000.'"

The Greene and Fayette Oil Excitement.—We learn (says the *Harrisburg Patriot and Union*), from a gentleman who has just arrived from the oil regions in Greene and Fayette counties that the oil excitement thereabouts is intense, as great as it used to be about Titusville and Oil City. The oil discovered there is of a very pure quality, called Amber Oil. Several companies have already been formed and before many weeks pass round all the available territory will be bought up. There remains but little doubt that there is as great an abundance of oil in these two counties as in Venango or up the Kanawha Valley. The Uniontown Standard says:

"Quite a number of our citizens having visited Dunkard creek and observed the indications, aside from the actual possession of the oil, such as the peculiar appearance of the surface soil, the cropping out of rocks peculiar to low formations, the relative positions of the coal veins to the surface, &c., were induced, from their similarity to several points in Fayette, to lease some of the most available territory and commence a thorough investigation immediately. Brown's run, a stream running through German township, and emptying into the Monongahela above Davidson's ferry, and the farm of John Pain, on Redstone creek, a few miles below Uniontown, seem to be the particular points of attraction. Companies are formed—one of them sinking a well, and the other will be ready to go into operation in a few days. The indications at these points are such as to almost insure success—oil and gas appearing in such quantities as to justify the conclusion that all that is needed to put Fayette on a par with her sister county in the oil trade is but to sink the shaft."

SHERMAN OIL COMPANY.

This Company owns in fee simple, the Richardson farm, containing one hundred and thirty-nine (139) acres, situated on Oil Creek, about five miles and a half below Titusville. This farm has never been developed, save by a well sunk about 150 feet three years ago when oil declined to such a low price that a great number of wells were abandoned, this among the rest. It has every indication of being a good well, as it now has oil in the opening. The Company will immediately proceed to drill this well to the proper depth, and sink other wells. On the farm adjoining this property are several other good wells, and derricks are being erected all around it, some twenty wells now being down in depth from 400 to 500 feet, with fine shows for oil.

The Company also have the follwing producing interests, now yielding the Company about twenty-five barrels per day, viz:

1. One twenty-first of all the oil produced, or to be produced, on the Titus Lease, (Lot No. 33,) on the Story farm, containing two and a half acres of the very best Oil Territory. With this lease, there are tanks sufficient to store 4000 barrels of oil, two good engines, nearly new, 4,500 feet of tubing, and other machinery and implements. There are three wells on this lease, two of which are now flowing from 225 to 235 barrels of oil daily; the third is now being tested, with every indication of being a large well.

2. One-half of the working interest, or one-third of all the oil produced on Lot No. 2, on the Gillespie Tract, Wild Cat Hollow, George Washington M'Clintock Farm, consisting of three and a quarter acres, and now yielding from eight to nine barrels daily.

3. The Land Interest, or one-eighth of all the oil produced on the Swamp Angel Lease, on the George Washington M'Clintock farm, now producing about sixty barrels of oil daily.

It is intended to reserve Five Thousand Shares, to be sold before any other Stock is offered for sale, for the purpose of raising a Fund as a working capital.—*Phila. Coal Oil Circular.*

A cement which is a good protection against weather, water, and fire, to a certain extent, is made by mixing a gallon of water with two gallons of brine, in two and a half pounds of brown sugar and three pounds of common salt. Put it on with a brush like paint.

MINING.

COPPER SMELTING AT DETROIT.

Probably the most extensive and profitable Copper Smelting establishment in the United States, is that known as the Waterbury and Detroit Copper Smelting Company located about two miles below the city of Detroit, in the state of Michigan. It is a private company, and the details of its business have never been made public. Common report, however, states that the profits of the establishment are very large; at all events the works have been continued with great diligence for some twelve years, and the metal turned out at this establishment, it is said, readily brings $20 per ton more than that from any other establishment in the country. The amount of copper produced there has averaged, for several years, about 4,000 tons. One year it reached 5,000. The last year's work, however, did not exceed 3,500 tons, on account of the scarcity of labor at the mines for producing the ore; the greatly enhanced price of the article, however, brought the aggregate value of the yield of this establishment quite up to that of any previous year, viz: a little over $2,000,000—the average price being nearly $620 per ton. There are four smelting establishments in the country employed chiefly in smelting ores from the Lake Superior mines; one at Cleveland, Ohio, one at Pittsburg, Pa., one directly in the mining district, and the fourth in Detroit. The Detroit Commercial Advertiser, gives the followihg description of the works at Detroit:—

The buildings embrace four refining furnaces, and two cupola blast furnaces, and they stand at a convenient distance from the river, with a substancial dock in front for the purpose of receiving the ore and shipping the metal in its manufactured form. The ore is brought down in vessels from the several mines, and after being smelted, the copper is shipped to New York, Philadelphia, and Boston, where, from its superior quality, it commands a higher price by one cent. per pound than any other copper in market. The ore differs in purity, yielding from seventy to eighty per cent of pure copper. The mineral, as it is received at the works, is first placed in refining furnaces, and being subjected to a sufficient heat, the pure copper, in its molten state, tends to the bottom of the furnace, whilst the rocky substances, having a less specific gravity, rise on the top, when by suitable implements, they are removed. This excresence is called "slag" and is afterwards intermixed with lime rock and submitted to the intenser heat of the blast furnace, when considerable copper is further extracted from it, which is run into large sand moulds in iron frames, which when filled, are suffered to cool, and the contents is emptied in large masses, weighing probably four hundred to six hundred pounds, and reconveyed to the refining furnaces, where it is mixed in with fresh ore. When sufficiently heated, the whole contents undergo the process of separating the iron and sulphur, by a simple process, and being carbonated by burning green wood in it, a process which requires great experience and skill, it is ready to be turned out into moulds. It is cast in the shape of ingots and bars, the former weighing about 16 lbs., and the latter 100 or 150 lbs. The ingots are packed in large and substantial barrels and sent off to the Eastern markets. The bars are nearly a yard long, and about three inches square, somewhat tapering at one end, and are designed chiefly for wire, an immense amount of which is manufactured annually in this country.

Washing Ores and Minerals.—A simple form of apparatus for washing ores, minerals and other metalliferous earths, whether of the richest or poorest descriptions, has been patented for Messrs. Baron, of Paris. It consists in the employment for that purpose of a long tapered vessel, partially filled with water, open at the top, and provided near its surface with a corresponding shaped trough, slightly inclined downwards towards its narrow end.—This trough receives a longitudinal vibratory motion from a crank or eccentric on the main actuating shaft of the machine, and it also receives a simultaneous rocking motion in a lateral direction. The bottom of the vessel has a number of closed apertures for removing the deposit that collects thereon, which are nearer together as they approach the narrow end of the vessel, at which part they are separated by double inclined partitions. The feeding hopper is provided with a rose jets at its discharging mouth, which directs a number of fine streams upwards into the minerals or ores contained therein, such minerals or ores having been previously crushed. The richest ores or minerals pass down the vibrating trough, and fall over at the end, being thus deposited at the narrowest end of the vessel, whilst the refuse matter and poorer particles are shaken over the sides of the trough before arriving at the ene thereof, the poorest being skaken over at the top end of the trough, and the better descriptions lower down, so that each aperture will give a richer product as they approach towards the narrowest end of the vessel. The water in the vessel is stagnant—that is to say, it is not changed constantly by having a current flowing through the vessel, as is the case in other washing machines.

The extraction of silver, as pursued in Nevada Terr. tory and California, comprehend Four Processes, known as the Wet, the Roasting, the Cold and the Melting Process. Of the first of these, we will say a few words, leaving the others to subsequent consideration. All combinations of silver with other ores are not suited for this process, but it is very available in working some ores unroasted; especially such as ore not argentiferous pyrites of arsenic, iron or copper, associated with antimony. Smith's Process attracted attention first, about 3 years ago; by this the ore is roasted in iron pans 4 feet in diameter. Subsequent improvements in the mechanism of the implement increased the charge of ore from 50 lbs. to 750 lbs., and finished the amalgamation in one half the time, that is, in 3 hours. This improved pan, now called Wheeler's, has really effected an improvement in the chemical part of the plan. Friction and iron themselves, acting as chemicals, decompose silver sulphurets, and Wheeler's pan, without chemicals, yields more metal and in less time than when the ore is treated with chemicals in a stone arrastra. Dry crushing, injurious to machinery, is not required, and the resulting silver is very fine. As the difficulty of decomposition grows with the amount of sulphur or antimony in the ores, the process is not yet satisfactory. Still, it proves that the decomposition of argentiferous sulphrets does not altogether depend on chemicals, and no chemicals or other substances have not yet been applied, by which more than 60 per cent. of the silver can be extracted, unless on account of gold or the prevalence of silverglance.—*Amer. Exchange and Review.*

The Iron Business of Lake Superior.—The amount of iron-ore shipped from Lake Superior in 1855 was 1,447 tons, against 116,998 tons in 1860, and 185,557 in 1863. These amounts, says the Marquette Journal, especially those for the last two years, fall far below the demand, the difficulty having been in procuring transportation for the ore and men to mine it. The quantity actually spoken for to supply the various furnaces using this ore, before the opening of navigation in 1862, was over 140,000 tons, while in 1863, 250,000 tons would not have supplied the demand.

Large investments have been made in timbered lands, along the lines of the Marquette and Ontonagon and Peninsula railroads, as well as on Big Bay de Noquet, with a view to erect blast furnaces for the manufacture of charcoal pig-iron. The average value at Marquette of the ore shipped during the past year was $5 per ton, and that of the pig iron produced $45 per ton, giving the aggregate value of the iron product of the country for, 1863, $1,327,245,245.

MINING SHAFTS AT WASHOE.

The Gold Hill News says:

"Tunnelling appears to have been better understood than sinking shafts, by our first miners, and appears to have been the favorite means of opening the mines, for there are now but few claims which were located and worked in '60 or '61 which had not tunnels run into them at that time. Later experience has shown shafts, when properly constructed, to be the most efficient way of opening a mine, and now, there are but few mines which produce pay ore but what are worked through them.

"The most common manner in which shafts were constructed here, four years ago, was round, like a well, but that mode of building them was soon discarded, and a year or two later they were generally built like our double shafts at present, in two equal sized compartments. Two years ago there were a few shafts commenced with three compartments, each four foot square, but they were than considered to be of extra size. A year later, and nearly every company which considered its claim as a promising one, if it had occasion to sink a shaft, commenced one of those dimensions. This present year there appears to be a desire to construct shafts even larger than before. The Ophir Company is sinking one on its claim which is nine feet by twelve in the clear, inside of its timbers, and is now 300 feet deep. The Savage Company is down 115 feet with its new shaft, which is even larger than that of the Ophir. This latter shaft is composed of four compartments, each five by six feet in size in the clear, which makes a working space of 120 feet.

"The Overman Company, too, is sinking a large shaft; so is the Yellow Jacket Company; and also others which we could mention. These new shafts are being timbered more substantially than those which were constructed earlier. The round shafts which were first constructed were seldom timbered at all. At a later period two-inch planks were generally used. A year ago, almost all companies used three-inch planks. At present, it is common to use four, five and six-inch planks, and in several of our claims the shafts are being curbed with hewn timbers a foot square, and in some of these the timbers are even bolted together. These improvements in the manner of working our mines show a confidence in their value which nothing but the strongest evidence of their richness could inspire."

These shafts at Virginia and Gold Hill are mere trifles compared with some of those in Mexico and Spanish America. The Valenciana mine, near Guanajuato, in Mexico, has a shaft 1750 feet deep and 32 feet in diameter, walled up the whole distance in solid masonry. The various shafts in this one mine cost more than $2,000,000. Ward, in his book on Mexico, says:

"The works in the interior occupy nearly half an English mile in extent. In order to give access to the different levels various shafts have been sunk, the first of which, called the "Tiro Viejo de San Antonio," is said to have cost $396,000. Through this the first great *bonanza* (lot of rich ore) was raised. The Tiro de Burgos and the Boca de San Ramon, were next purchased and incorporated with the great mine, (they cost $82,000,) and the hexagon shaft of Nuestra Senora de Guadalupe was afterwards sunk at an expense of $700,000. All these being deemed insufficient, the great octagon shaft, called the "Tiro General," was begun in 1801, and carried on until the commencement of the revolution, when it had cost nearly $1,000,000, and attained the depth of 635 varas."

THE IRON TRADE OF THE WORLD.

Nothing, says the *Mining Journal*, has so much contributed to the comfort and civilization of the human race as the development of the various industries and extended enterprises which owe their existence to an abundant supply of iron. Perhaps the most striking development of material progress during the last 35 years is the introduction of the railway system. During that period there have been constructed 113,000 miles of railway in the world; and this appears to us as the mere prelude to the extension of this enterprise on a scale so vast as scrrcely any living man can conceive. There has been expended on these 113,000 miles of railway already constructed upwards of 40,000,000 tons of iron.

Great Britain and France control the world, and, fortunately for the happiness of mankind, they seem to

have elected in favour of peace; and their enormous resources, which might otherwise have been dissipated in war, will unquestionably be diverted to that other great enterprise, which we regard as having merely commenced—the construction of railways, which, proceeding at an increasing ratio, will only be retarded by the limited supply of iron that can be furnished by the mines of the world. The immensely increasing demand for ships and steamers built of iron will also of itself form a large drain upon our production of this mineral.

There are now about 350,000 tons of iron in warehouse-keepers' stores in Scotland which is the only reliable reserve for a trade embracing 4,000,000 tons per annum. The shipments of pig iron from Scotland this year have been 401,600 tons, showing an increase of 28,649 tons over the corresponding period of last year; and the foundries and malleable ironworks in this district have been so actively employed as to give rise to a consumption of about 12,000 tons weekly.

It is rather a striking occurrence that recently upwards of 35 furnaces have been put out of blast in Staffordshire, although the price of pig-iron has ruled in that district from 70s. to 75s. per ton. Nineteen years ago the price of Scotch pig iron attained 120s. per ton, and for many months afterwards it was maintained at above 100s. per ton. In 1854 the highest price was 92s. 6d., and the average price for that year was 80s. per ton.

It may be noted as a singular feature in connection with the iron trade, that the highest range of prices for iron seems to be coincident with high rates of money.

PROFITABLE MINING IN GREAT BRITAIN.

We have always endeavored to prove that mining, as compared with other branches of British industry, yields greater profits to investors, and with equal certainty. That failures do occur, and considerable losses therefrom arise, is undeniable; but in many, if not the majority of instances, these disasters are caused by the want of caution with which the public will sometimes rush into speculations, without considering the probabilities of success. This, however, is not the rule in mining adventures, it is simply the exception; and we think that, with the assistance of a few statistics, we can demonstrate to our readers that, on the whole, mining enterprise returns a good per centage on the amount invested.

At the present time there are in course of working in the United Kingdon 63 mines paying dividends from profits, and of which Cornwall contains the greatest number. These mines produce various metallic ores—gold, copper, lead, tin, and iron; some are worked only for one of these substances, others for two or more. There is but one mine which makes profits from yield of gold,—the Vigra and Clogau, situate in Wales, and which is also worked for copper. Upon an outlay of £16,800, or £4 per share, this undertaking has declared dividends of £25,725, or £6 2s. 6d. per share. Of mines producing copper only there are 18 in the Dividend list—in Cornwall 3; Clifford Amalgamated, East Basset, East Carnadon, Marke Valley, North Treserkby, Par Consols, South Caradon, South Tolgus, South Frances, West Basset, West Damsel, West Seton, and Basset; in Devonshire, 2, Bedford United and Devon Great Consols; in Cheshire, 1, Allerly Edge; in Anglesea, 1, the Parys Mines; and in Ireland, 1, the Wicklow Mine. These mines, upon aggregate outlay of £279,843, have declared dividends of £2,702,437, the several counties contributing in the following proportions:—Cornwall, with 13 mines, has paid £1,580,295, on £229,986, expenditure; Devonshire, two mines, £988,212, upon £10,357; Ireland, one mine, £10,850, upon £17,500; Anglesea, one mine £20,500, upon £10,000; and Cheshire, one mine, $11,580, upon £12,000. It will be seen from the above figures that the returns on the aggegate capital invested have been £965·69 per cent.—a result sufficiently favorable in itself, but on examining into the gains afforded by certain mines individually we find products still more startling. For instance, Devon Great Consols has paid £934,912, upon £1024 outlay, equal to 91,300 per cent., or £913 for every £1 embarked. Par Consols, upon an expenditure of £7,200, has paid £256,000, equal to 3,555 per cent., or 35·55 for every £1. South Caradon, upon £640 expended, has declared dividends of £224,512, equal to 35,080 per cent., or £350·80 for every £1 embarked. South Frances, upon an outlay of £9,393, has returned £183,855, equal to 1·957 per cent; and Basset, upon £2,624, only expended, has declared dividends amounting to £307,200, or 11,707 per cent. All these undertakings continue to pay well, but there are certain mines which have proved exceedingly profitable, but are now abandoned, or have discontinned the payment of dividends during the extension of the works or machinery. Among these, Tresavean, which returned £4,677 15s. per share, upon an outlay of £32, 10s., or equal to 1,439 per cent. upon the capital embarked; and Buller, which, upon an expenditure of £5 per share, paid dividends of £929 per share, equal to 18,580 per cent., are prominent examples of successful mining.

Of mines producing both copper and tin, we have nine at present paying dividends, all situate in Cornwall—Boscaswell, Botallack, Carn, Brea, Dolcoath, Drake, Walls, East Pool, Great Vor, Seton, and Tincroft. Upon aggregate outlay of £430,641, these nine properties have declared dividends of £880,848, equal to a return of 204 per cent, on the capital embarked. The most profitable of the above named undertakings have been Botallack, which, upon an expenditure of £18,250, or £91 5s. per share, has divided amongst the shareholders £95,550, or £477 15s. per share, equal to 523 per cent; Carn Brea, which has returned £280,500, upon £15,000 outlay, or equal to 1·870 per cent.; Dolcoath, £270,827 dividends, on £ 46,137 expended, equal to 587 per cent.; and East Pool, £ 46,784 dividends, upon £ 3,104 outlay, equal to 1,507 per cent. upon the capital employed. Of mines producing copper and tin, which have been profitable, but are now paying dividends, the following are the most important:—Condurrow, which, upon £45 expended per shaae, has made profits of £ 85 per share, or 188 per cent.; and Levant, which has paid dividends of £ 174,560, upon £ 400 outlay, equal to the enormous return of 43,640 per cent., or £ 43,640 for every £ 1 invested.—*London Mining Journal.*

HOW COAL IS HANDLED AND BREAKAGE SAVED IN LONDON.

Yesterday, several of the principal railway coal merchants in London attended by invitation to inspect the new coal depot, constructed by the London and Blackwall Railway Company, near the junction of Royal Mint street with Leman street, in the city. The depot has been built by Mr. W. Tite, M. P., the engineer of the railway, on Plimsoll's principle; and as it seems to be a very considerable improvement on any yet constructed, and is besides the model on which some new depots at King's cross and elsewhere are shortly to be constructed, a brief description of its principal features will be interesting to such of our readers as are connected in any way with the coal trade. In the first place, the whole of each day's delivery of coal from the depot is taken directly from the railway trucks, which are standing in the depot loaded, thus causing much less detention of the railway wagons than when the day's delivery is taken from the bays, which are afterwards filled up from the railway wagons during the evening and night. Next, the bays are constructed to contain not less than 300 tons each (instead of 40, as at King's cross,) and into these every evening such coal as may remain unsold in the railway wagons is deposited gently so as to avoid breakage; not, by the necessity for its being first sold next day, to detain the newly-arrived trucks, but to remain in reserve until from some cause or other the supply of that particular kind of coal might be interrupted for a day or so, or the day's supply prove less than the sales of the day required.

The possession of such a reserve has long been urgently required for railway coal, as, being without a particular description of coal even for a single day is often productive of serious inconvenience and loss of business to the owner or merchant; it not only loses him the dealers or, as it is called, "fetched" trade for that day, but diminishes that of the first day or two after the supply is resumed until, indeed, the fact of a further supply becomes advised to the dealers. The greatest advantage, however, of the new plan is that it entirely does away with the great breakage the coal is subject to by the existing mode of unloading it, a breakage so great that whilst it greatly reduces the size of the coal which is delivered to the public, has also this effect—that its subsequent screening takes no less than 7, 8, and, in some cases, 11 per cent ont of it as small coal, which very seldom sells for more than the cost of carriage, and sometimes for even less.

The *modus operandi* is as follows:—The trucks are pushed up to a scotch, and there a nicely balanced hopper rises from below and encloses the bottom of the truck; this hopper debouches between the front and hind wheels over the rail, and so, without any concussion or smash whatever, gradually conducts the coal to the top of the screen leading to the scales, the angle of descent being just sufficient to impart motion to the coal.

The coal merchant will by this means be enabled to deliver the coal to his customers as large and round as when it leaves the colliery, and himself be saved the loss of having 6 tons in every 100 made into small coal produced by the new mode not being more than from 2 to 2½ per cent, instead of from 7 to 9.

A minor feature of the new method is, that the kind of screen is adapted carefully to the kind of coal; the longitudinal iron-bar, while doing very well for Wallsend, and other coals having a conchoidal fracture, being quite unsuited to the laminated, rhomboidal, and and rectangular—of the latter kinds many pieces shaped like dominoes or card-cases, would slip between parallel bars edgewise—for these descriptions screen-plates, having circular holes, are employed, and for others squares, hexagons, and diamonds, the fitness of each being carefully adjusted to the kind of coal.

It is claimed that a saving of labor will be secured also; this is open to great doubt, but it is certainly clear that an enormous saving of breakage is effected, which will be an advantage to the consumer, and a great saving to the merchant.—*London Mining Journal.*

AN OLD CANAL IN EGYPT.—About 600 years before the Christian era, Darius Hystapsis constructed a canal from the Nile to the Red Sea, in some places 150 feet wide and 39 feet deep. It took its passage through the valley to the Bitter Lakes, and was only navigable by vessels of large size when the Nile was high; it also served for the supply of the cities with water. The ancients assumed that there was a difference of level between the Red Sea and the Mediterranean, and they consequently guarded against the mixing of the salt water of the Red Sea with that of the Nile. The canal fell to decay, but was restored in the seventh century by the Turkish caliph, Omar, with many improvements, and brought to join the Nile at Cairo. It became again choked up 120 years afterward, and for a thousand years it remained so, and was almost forgotten till Napoleon went to Egypt. It was then surveyed by Napoleon's engineer, La Pere, who reported that "the rise of high water in the Red Sea was six feet; in the Mediterranean one foot; and the surface of the former was very high, at high water, above low water in the latter." He also reported that "the length of the canal was about ninety-three miles, through a low, barren, sandy plain, traversing many lagoons and lakes, offering but few difficulties to engineering." It has never since been reconstructed.

To remove iron stains, the iron is first dissolved by a solution of oxalic acid in water. The oxalate of iron thus produced, which, unlike iron-rust, is soluble, is readily removed by washing or soaking. Ink-spots [tannogallate of iron] upon the printed leaves of books are removed in the same way; but the lamp-black of the printer's ink is not at all effected; if old and dry, a very little remain.

GAS.

ON A NEW METHOD OF GAS-ANALYSIS.

By A. W. Williamson, F.R.S., and
W. J. Russel, Ph. D.

On a former occasion we described a simple and accurate process for the measurement of gases, and its application to gas-analysis. The especial advantages of the process are that a smaller number of observations are necessary to ascertain the true volume of a given amount of gas, and that the calculations necessary to deduce, from the observed volumn, the bulk it occupies at the standard temperature and pressure, are entirely eliminated. The process thus renders the measurement of a gas more expeditious, and in making it a s mpler operation, renders it more acurate, by diminishing the chances of error.

The principle on which the process depends is that of using as a standard of comparison, a constant quantity of air, which is always brought to the same volume. This is effected by marking off, once for all, on the tube containing the air, the height at which the mercury stands; then the effect which any rise or fall of either the barometer or the thermometer would produce on the bulk of the air, may be exactly counteracted by raising or lowering the tube in the mercury trough until the mercury again comes to the mark. The gas in the eudiometer has to be brought to exactly the same tension as that of the standard volume of air. This is done by placing the two tubes side by side, and raising or lowering the eudiometer until the column of mercury within it is of the same height as that which is required to bring the standard quantity of air to the original volume. In the communication before alluded to, we described a convenient form of apparatus for measuring gases by this means, and showed its application to the process of gas-analysis described by Bunsen. Experience having long confirmed our views with regard to the advantages of this method of measuring gases, we were naturally led to attempt founding upon it a more rapid method of executing analysis.

The forms of apparatus invented by Regnault and Frankland have proved to how great an extent the time required for making an analysis may be diminished by surrounding the tube containing the gas with water instead of air, and by using the reagents in a liquid form; nevertheless, neither of those methods, as is well known, has come into general use. This, we believe, arises mainly from the apparatus being of too delicate and fragile a nature. In order to stand ordinary laboratory use, an apparatus of this kind must, we are convinced, be without stop-cocks or other delicate mechanism. It must also be constructed of such a form as not easily to be broken, and these requisites must be obtained without in any way diminishing the accuracy of the process. To construct an apparatus having these qualifications was far from an easy task, and it is only after considerable labour and numerous experiments that we have been able satisfactorily to accomplish this task. We will not lengthen this communication by describing the different forms of appratus we have from time to time constructed, and the modifications which they have undergone, but proceed at once to the description of the apparatus in its last and most perfect form.

The tube containing the standard quantity of air we term the pressure tube. The wide part of the tube is about 7in. long, and $\frac{3}{4}$in. diameter; in fact, it should be a piece of tubing similar to that of which the eudiometer is constructed. The narrow part of the tube is 17in long, and $\frac{3}{8}$in. diameter.

The pressure tube is carried by a steel rod, 30in long and $\frac{3}{4}$in. diameter, at the end of which is a clamp consisting of two straight bars, $\frac{1}{2}$in. wide, $\frac{1}{4}$in. thick, which extend down the whole length of the wide part of the pressure tube. Two flexible steel rings are fastened, one near the top of these two bars, the other at the bottom. They are let into and firmly fixed to one bar, and by means of a screw passing through the other bar, the two ends of the ring can be brought together and held securely. By introducing a little india rubber padding between these rings and the tube, then screwing the rings tight, the pressure tube is held with great firmness, and is kept in the same straight line as the rod. Firmly fastened to one of the bars forming this clamp are two other pieces of metal, at right angles to it, passing across the back of the tube. They are $1\frac{1}{2}$ in. long, the upper part $\frac{1}{2}$in. thick, but narrowing gradually, so that the lower edge has only the thickness of a very blunt knife. These two cross pieces serve as marks idicating exactly where the mercury must stand in the tube for the contained air always to have the same volume. We use two marks, in order that when operating with only a small amount of gas, it may be considerably expanded; but that when using a large amount of gas, it need not be expanded to the same extent. The height of the mercury in the pressure tube is altered by raising or lowering the rod in the clamp; but the final adjustment, the raising or lowering of the mercury, so that the meniscus exactly touches the lower edge of the cross piece, is performed very simply and accurately by altering the level of the mercury in the trough. This is done by screwing up or down a piece of large glass tube, which is in the further end of the trough. We shall allude again to this piece of apparatus when describing the analysis of a gas. It will be seen from what follows that it is absolutely necessary that the steel rod carrying the pressure tube be perfectly straight, and in order that it may move when raised or lowered in the clamp always in one plane, it passes through a tube, which clasps it very accurately, and is 6in. long; in fact, the tube is made to act like a spring on the rod by having two slits cut in each end of it. The rod, when greased, slips easily through the tube, but is held firmly by it If, however, the weight of mercury in the pressure tube should be to great for this spring to hold, the screw, is used, which by pressing against the rod, securely holds it at any point. The whole clamp carrying the pressure tube slides on one of the long, stout rods passing through the table. A groove is cut in the top of the rod for the screw to move in. The object of this is to retain the clamp always in the same vertical plane. To render the pressure tube ready for use, a very small drop of water is placed at the closed end, and mercury poured in until only a small quantity of air remains. The tube is then inverted in the mercury trough, and more air let in, a few bubbles at a time, until when the pressure tube is brought to its proper position, the mercury within stands near the upper marker.

The tube containing the gas to be analysed is an ordinary Bunsen's eudiometer. It is held and moved up and down in the same kind of way as the pressure tube. The only difference is that the clamp on the eudiometer is very much shorter than the one on the pressure tube, its length being only 3in. It is constructed in the same way, only without the two horizontal pieces at the back.

There is, however, an essential difference in the upper clamp through which the steel rod passes; to this is attached a simple apparatus for raising or lowering the eudiometer through small distances. It is similar to the fine adjustment we described in our former paper on the measurement of gases. The steel rod is clamped to the eudiometer; this passes through a stout tube, and can be firmly attached to it by a screw passing through the top of it, which is thickened for this purpose. The length of this tube is 4in. Again, this tube is within a second tube, which is fixed by the bars, to the tube sliding over the thick rod fastened to the table. The fine adjustment is then effected in this way: a piece of cat-gut which is fastened to the end of the first tube, is wound round the axis, and passes through a hole in the centre of it. The handle is attached to this axis, so that when it is turned round, one half of the cat-gut unwinds, while the other half winds round the axis, and draws the tube either up or down. A friction-screw moving up and down in an opening cut in the exterior tube, and is screwed into the inside tube. On tightening this screw, it presses more strongly against the outside tube, thus increasing the friction with which the inside tube moves. This arrangement is necessary as it might often happen when the eudiometer was high out of the trough and merely full of mercury, that the weight of it was sufficient to unwind the cat gut on the axis and cause the tube to fall to its lowest position.

The general form of the mercury trough, is made of gutta percha. The sizes given are all inside measurement. The length is 9$\frac{1}{2}$in. The thickness of the gutta percha sides is $\frac{1}{2}$in., and their height, 5in. The left hand part of the trough, is 3$\frac{3}{4}$ in. in diameter and 5in. deep.

In the right hand portion of the trough, the greater part of it is solid gutta percha to a height of 2in. from the bottom. To the upper part of each of the tubes the clamps before described are screwed, and the steel rods attached pass through, and can be held by, other clamps fastened to thick iron rods passing through the table. Into this round part of the trough fits a glass cylinder, about 27in. high, which is to be filled with water when the apparatus is in use. The cylinder is supported near the top by a ring fastened to one of the iron rods passing through the table, and the mercury in the trough prevents the escape of the water. The cylinder can thus be put on or taken off with great readiness. When the apparatus is in use, the mercury outside the cylinder stands at a height of about 1in. from the top of the trough. In the method of analysis adopted by Bunsen, the reagents are introduced into the eudiometer. This procedure necessitates the use of only solid reagents, which can absorb the gases but slowly, and besides introducing a small error, namely, that of the gas always adhering to the surface of the reagent, it has the inconvenience, even with the greatest care, of dirtying the inside of the tube, and thus often rendering the reading off of the bulk of gas unsatisfactory. It is quite obvious that to remove these objections, a separate vessel must be used, into which the gas must be passed when the absorption of any of its constituents has to be effected. This is the laboratory tube of Regnault and Frankland. The form of apparatus best suited for this transference of gas from the one tube to the other, is a point which has engaged much of our attention, and after making many experiments on the subject, we have adopted a process which is exceedingly satisfactory. By the means we are about to describe, the passage of the gas from the one tube to the other is complete, and easily effected; the apparatus is not fragile; and there is no stopcock or other source of leakage. Down the center of the eudiometer well, a glass tube, of about $\frac{3}{8}$in. diameter and very small bore, passes; it is bent round at the bottom, curving up in the small addition to the well. When within about 5in. of the trough, the tube bends, but afterwards, again becoming straight, rises vertically into the right-hand part of the trough in the centre. Over this end of the tube is passed a vulcanised india rubber pad with a short tube attached to it. The lower part of the india rubber tube is bound with wire tightly on to the glass tube, so that the tube projects 3in. above the top of the circular pad, which is 3in. in diameter and $\frac{1}{4}$in. thick. It rests on an iron plate, which has a hole in the centre for the tube to pass through. This round pad and iron plate are supported by the solid gutta percha round the inside of the right hand portion of the trough. The object of the india rubber pad is to afford an elastic surface for pressing the laboratory tube upon. The laboratory tube, or rather laboratory vessel, we use, it is round and made of rather thick glass. The height of it is 3in., so that the syphon tube reaches exactly to the top of it. The end of the tube should be rounded, so that the middle part is higher than the outside. The laboratory vessel is pressed down on the caoutchouc pad by means of a flat iron bar passing over the top of it. On each side of the trough there is an iron rod fastened into the table; a hole in one end of the flat bar allows it to pass over one of the rods; and a slot in the other end admits of its being brought so far, that the other rods is also in the centre of the flat bar. A screw is turned on the top of the rods, so that by means of a large nut the bar may be pressed with very considerable force down on the top of the laboratory vessel. Instead,

however, of the bar pressing directly on the top of the glass, it is better to have a small round iron frame roughly fitting on it, and having on the upper side a wedge-shape piece of iron, on the thin edge of which the bar before described presses; by this means the pressure is more equally distributed over the whole of the laboratory vessel.

This laboratory vessel being thus held firmly, we can first expel the air from it by allowing mercury to flow into it throug" a tube connected with a reservoir of mercury at the height of about 3½ft. above it. The tube forms part of the caoutchouc pad, and enters the wide part of the tube at right angles. When the pad is in its position in the trough, it passes through a hole in the side, and then through the small supplementary trough, out along the gutta percha tube. A short piece of caoutchouc tubing slipped on and bound to both these tubes serves to prevent the escape of the mercury from the trough. The end of this tube is fastened to the vessel, which forms the mercury reservoir. The reservoir is fixed to a wall, or other convenient support, above the trough. The use of the supplementary well, is to contain a clamp, by which the flow of mercury from the reservoir can be regulated. This clamp is of very simple construction. It is placed in the trough, before passing the long tube through, so that the tube has to pass between the steel bars. After screwing the nut to a proper position on the rod, we can allow the mercury to flow from the reservoir, simply by raising the rod out of the slot, and allowing the bars to separate, and stop it by again bringing them together and replacing the rod in the slot. By this means we can very conveniently fill the laboratory vessel. The mercury flowing in at the bottom drives the air before it, and causes it to escape through the syphon tube, and the mercury rising gradually to the highest part of the laboratory vessel, expels the last particle of air from it, and then fills the syphon tube. In this way the air is expelled at the commencement of an analysis from the the laboratory vessel, and a gas, after it has been treated with any reagent, as returned to the eudiometer for measurement. The reverse operation, the drawing the gas out of the eudiometer into the laboratory vessel, is effected by forming a vacuum in this vessel. To accomplish this, there is a small caoutchouc tube, which is fastened to, or rather forms part of, the pad. The diameter of this tube is ¼in. It passes through the pad at a distance of ⅜in. from the large central tube. The length of the latter tube is 4in. It should be made of the best vulcanised india rubber, and be from ⅜ to ½in. in diemeter.

[TO BE CONCLUDED IN OUR NEXT.]

AN IMPROVED STOVE FOR COOKING BY GAS.

Mr. Edwin A. Leland, of 117 Broome street, this city, has just received Letters-Patent (No. 44,,372, dated Sept. 20, 1864) for an improvement in gas stoves for cooking purposes. The invention consists, firstly, in the construction of that part of the stove directly over the gas-burners with two plates, having a space between them; the upper plate having holes for the bottoms of the boilers, kettles, or other cooking vessels or utensils; and the lower one having corresponding or opposite holes by which the flame and heated products of combustion are concentrated under and around the bottoms of the said vessels or utensils, and caused to act thereon with better effect than in the stoves heretofore in use. The improvement also consists in the employment, in combination with the said plates and with an oven arranged in the rear of the gas-burners, of a descending flue, which conveys the heated products of combustion downward in front of the oven to the flue below the same, whence the said products pass through a sheet flue under the oven, thence vertically upward through a sheet flue behind the oven, and forward through a sheet flue over the same; thereby giving the said products a circulation entirely around the oven, and heating the same more perfectly and economically than is done in other gas-stoves.

To avoid family quarrels, let the quarrelsome person have it all to himself; reply never a word.

MISCELLANEOUS.

FRUGALITY.

Perhaps no greater marked change in the habits of the American people can be found than in their habits of economy. Our ancestors were exceedingly frugal, both in food and clothing, and suffered nothing to be wasted. The very first element of training given to children was never to waste, and this became the ruling influence of the domestic circle through life. How to get along with the least expense—how to make a garment do long service—how to make the smallest outlay produce a given result—were considered questions of importance, and worth studying. But, within a few years, how great the change that has come over the people, and revolutionized the genius of saving into the genius for wasting! Now the effort and rivalry is to see who can outdo the rest in expenses, in brilliant display, in gaudy attire, in gorgeous house furniture, in fast horses, in dissipation and luxuriousness in their never-ending demands. The leading idea taught the young is not to save, but to expend; and new temptations are brought out daily to induce the young to invest money in fancy matters as fast as possible. This habit being formed early, it is a matter of course that, on going into business, or setting forth in domestic life, it will be engrafted on the business or home arrangements, and eventuates in bankruptcy early and often. Particularly will the latter come if the demon of waste (or frivolous expense) gets the upper hand about home. The old proverb that "a woman can throw out with a teaspoon faster than a man can throw in with a shovel" has its peculiar force and significance in these times. We have had the reputation, here in New England, of having flourished and got rich on the industry and frugality of our women; but we fear the days of such boasting are nearly over. The temptations to outlay, for display, and the facilities in good times for getting the money with which to pay the bills, form too strong impediment to saving to be got over easily; and hence one need not be surprised to find, when a pinch comes, that the means of weathering a financial storm are not very general, and suffering is no uncommon occurrence among the working classes. We found this stubborn fact in the crisis of 1857; and as population increases, the mischiefs arising from the bad habits complained of will probably become greater. In Europe, the necessities arising from crowded population and rivalry of occupation have compelled the people for centuries to the strictest economy, so much so that there is probably but little if any room for improvement in this matter. Indeed, the fact related to us by our friends who have been there stagger to us to comprehend how life can flourish on so little income. We are informed that the wages of a french carpenter in Paris, a few years since, was seventy-five cents a day, or four dollars and a half per week; yet this man paid rent and fed and respectably clothed a family of four or five persons out of that small income. Who could do it here? A broad continent, with its untilled land; mines waiting for attack; rivers, seas, and lakes abounding with fish; and forests abounding in game, have all combined to supply us too plentifully with the means of living too well: we are, therefore, unfitted for the reverses that will come, or to bear the burdens of war with equanimity of a long time. Probably the experience of the Old World for a few generations will educate us to the frugality, and our descendants will return cheerfully to the simple style and habits of our forefathers.—*Boston Commercial Bulletin.*

WORTH KNOWING.

In household economy a great mistake is often made in the oversight of the fact, that the same number or weight of the same article does not always give the same amount of yield or nutriment.

In every three tons of coal, stove, range, or grate, passing your door from different yards, and to the casual observer all looking exactly alike, there is a difference in their heat producing value up to as high as one-half. Some coals clinker badly, others contain a great many thin flat pieces, but when put in the fire turn white; coal dealers call this "bone" as it has something of the color of burnt bone, it has no coal in it, and is a clear loss. Good coal will not have three pieces of "bone" in a whole day's burning; sometimes the grate is half full of these white pieces by bedtime.

Eggs are of different sizes. In any basket of eggs, the twelve largest and smallest will make a difference of perhaps one-third or more.

When we purchase apples by the bushel we get about the same number of pounds whether they be large or small, and so with potatoes, but there is more nourishment in the Mercer than in the Cusco variety, yet it is to the interest of the farmer to cultivate the "Cusco," even if he sold them at half price, because planting each variety in the same soil one acre will yield ninety-one bushels of the Jersey Mercer, while two hundred and forty bushels of the Cusco potato was the product of the adjoining acre, tilled in the same manner, as reported by Mr. Williams at the Farmers' Club of the American Institute in New York City.

A piece of "roast beef" in the process of cooking, looses fifteen per cent.; if boiled it looses only eleven per cent. If a leg of mutton is roasted it looses twenty-five per cent., but only ten per cent. if boiled. So that if you want a "roast" for dinner, beef is cheaper than mutton at the same price per pound, although mutton is four per cent. more nutritious than beef.

Wood.—Very few persons are aware of the wide difference between the amount of heat yielded by the different qualities of wood, and as wood is sold by measurement, while its value for giving out warmth is determined by its weight, each kind being equally seasoned and dry, it is well to be posted as to these points.

One cord of dry hickory wood will keep up a certain amount of heat for one hundred days, while a cord of pitch pine will last only thirty-five days, and a cord of white oak ninety one days, a ton of Lehigh coal will last ninety-one days. "Charcoal is charcoal,' all kinds are alike as to color, but a ton of pine charcoal lasts seventy-five days, maple a hundred and fourteen days, oak one hundred and sixty-six. In the light of these statements families may save a good many dollars every year.—*Hall's Journal of Health*

CENTRAL PARK.

We are indebted to the courtesy of George M. Van Nort, Esq., for the 7th Annual report of the Board of Commissioners, up to January 1st, 1864. The Central Park of 844 acres, has cost the city seven and three-quarter millions of dollars. There are completed six miles of road for horseback riding; seven of carriage driving, and twenty of walks. The Park was begun in 1859. The skating pound, for rowing in summer, is twenty acres in extent, four feet deep. The smaller pound near 59th street is four acres. New reservoir 106 acres, thirty-six feet deep, costing one-and-a-half millions of dollars, and holds a thousand million gallons of water, constructed in three years. Skating begins about Christmas and ends in February. There were 19 skating days the first winter, 38 the second, 27 the third, 50 the fourth and eleven last year up to December 31st, 1863. The art of skating was first practised in St. James Park, London, two hundred yeers ago, to 27th December 1862; the "runners" then were bones attached to the feet. The music days in the Park are from nine to twenty days. Rowing on the 20 acre pound is the great amusement for summer at thirty cents for half an hour for one or two persons, and ten cents additional for each one in addition; the circuit of the lake, a distance of two miles is accomplished in half an hour; for moonlight of a summer evening it is lovely; and then the water fountain and the cassino for ice cream, &c., on your way home, at moderate charge, or coffee, or a good supper, hot on the spot. During 1863 177,000 vehicles entered the Park, 16,000 equestrians and over half a million on foot. The average Sunday attendance at the Park is fifteen thousand, most in August, next in May. The greatest number

visit the Park from 3 to 4 P. M., a third of a million in a year; from 4 to 5 next; less than 2000, (of all the the four-and-a-half millions) before 6 A. M., and about as many from 10 to 11 P. M. The largest number of Pedestrians who visited the Park during any one day was on Christmas of 1863, being over 94 000 and only a hundred and six in December 17, 1863. The largest number of vehicles for one day was June 27th, near 10,000. A quarter of a million of trees and shrubs have been planted. The Park was laid out by a native of Hartford, Connecticut. The city does not pay a dollar of the interest on the mony expended on the Park because the land adjoining the Park has increased enough in value to make the assessment more than pay the interest; that is, the men pay the interest on the Park debt whose lands adjoin it and which on that account have increased so much in value. Fifth and Eight Avenues front the Park; not a house has been built on Fifth Avenue opposite the Park south of 70th Street, nor can a lot of twenty feet front, running back 100 feet be purchased for less than twelve or fifteen thousand dollars; that section is designed to be the "west end" of the great metropolis of the nation. Every person who wishes to entertain friends who may visit the Park together, should impress the above statements indellibly on the memory; they are just the items which every intelligent stranger feels an interest in knowing.

DETECTION OF BLOOD STAINS.

The most recent investigations have shown that the crystals of haemine discoved by Erdmann are the only constant elements of a solid judgment as to the nature of stains of a doubtful nature. There is no question but that blood-globules are characteristic of blood; but as in many cases the stains to be submitted to analysis are not recent, and as the red globules become altered with great facility, their presence cannot serve as an infallible criterion. As to the white corpuscles, Neuhauer has put in its true light the importance which has been recently attempted to be attached to them, by reminding microscopists that precisely similar bodies exist in urine, saliva, mucus, and it may be added in pus. On the other hand, a chemical examination cannot lead to a satisfactory result, because all the chief principles of blood are met with in other animal fluids, and in addition several vegetable albumenized matters present the same reaction as the albuminous elements of the blood.

Erdmann records a recent case which shows at once the insufficiency of a chemical examination, and the necessity which exists for an extreme reserve in all medico-legal microscopic researches. The only trace of an assassination committed at Leipsic was a brownish stain situated on the spot where the crime had been perpetrated; under the influence of rain this stain has assumed the appearance of coagulated blood. An aqueous solution of this stain furnished a reddish fluid, which gave, with tannin, with ferrocyanide of potassium, and with Millon's solution, the same chemical reaction as the acqueous extract of dried blood. Examined under the microscope, the brown matter was found to contain some corpuscles similar to those of blood. But Erdmann having failed to discover crystals of haemine, conceived doubts as to the value of the other characters, and repeated with greater care the microscopical examination; he then discovered that the bodies supposed to be blood-globules were the spores of an alga, which has been called the *Porphyridium cruentum* precisely on account of the resemblances of its spores to the globules of their blood.

Erdmann in the course of his subsequent researches has simplified the method of Brucke for obtaining crystals of haemine, and has reduced it to the following steps: He macerates the suspected stain in water and slowly evaporates the solution; he places this aqueous extract on one of the slips of glass used in microscopic examinations, and adds to it a minute crystal of common salt and a drop of glacial acetic acid; he exposes the slip of glass to a gentle heat over a spirit-lamp and it evaporates to dryness; when the glass is cool he adds a drop of acetic acid, and places the whole under a microscope with a magnifying power of 250 diameters. If the stain contained blood, crystals of haemine will infallibly be seen in the drop of acetic acid; these are rhomboidal plates arranged in groups around central point; their color varies according to their thickness from yellow to red; the special character of these crystals is their solubility in caustic potash. Erdmann mantains that by this method he has obtained crystals of haemine from a stain of blood which could not be seen without a magnifying-glass.—*Gazette Hebdon.*

ELEMENTS OF FOOD.

The ultimate ingredients of all food are carbon to warm, and nitrogen to make flesh. Some have no carbon, others no nitrogen, some have both in varying proportions, all have water or waste from five to ninety per cent. The table below is the result of the researches of the ablest chemists of the age. The amount of solid matter in an article of food, does not mean that amount of nutriment, for a portion of it may be woody fibre or waste, or lime, chalk, iron or other mineral. The cypher indicates that not one per cent of the element is found; na, not ascertained; blanks mean no published or reliable statements have been made. The more water, the more waste, for even woody fibre and iron have their essential uses in the system.—*Hall's Journal of Health.*

In 100 parts of, there is per centage of	Solid matter.	Water.	Carbon.	Nitrogen.
Arabic gum.....	88	12	36	0
Artichokes.....	28	80	9	0
Apricots.....	25	75		n.a.
Arrow root.....	82	18	36	n.a.
Almond oil.....	100	0	77	0
Butter.....	83	17	66	n.a.
Bread.....	68	32	31	n.a.
Beans.....	87	14	38	n.a.
Blood.....	20	80	10	3
Beef fresh.....	25	75	10	8
Beef tea.....	2	98	—	n.a.
Cabbage.....	8	92	—	0
Carrots.....	12	88	—	0
Cherries.....	25	75	—	—
Cucumbers.....	3	97	—	—
Candy.....	90	10	43	0
Egg white, of ...	20	80	—	—
Egg yolk.....	46	54	—	—
Fish average.....	20	80	—	—
Figs.....	84	16	—	—
Gooseberries.....	18	81	—	—
Hogs lard.....	100	0	79	0
Isinglass.....	92	7	—	—
Leguminous seeds.	0	0	37	—
Letils.....	84	16	37	—
Manna.....	—	40	—	—
Mutton suet.....	100	—	70	0
Milk of cow.....	13	87	—	—
Milk of ass.....	8	92	—	—
Milk of goat	13	86	—	—
Olive oil...	100	—	77	—
Oats.....	79	21	40	2
Oat meal.....	93	7	—	—
Oysters.....	1s	87	36	—
Peas.....	84	16	—	—
Potatoes	24	76	11	—
Peaches.....	20	80	—	—
Pears.....	16	84	—	—
Poultry.....	23	77	—	—
Rye	83	17	39	2
Sugar average...	—	—	42	0
Starch average..	84	16	36	—
Wheat.....	86	14	39	2

Odors from boiling ham, cabbage, etc., may be prevented by throwing red pepper-pods or a few pieces of charcoal into the pot.

Common cut-nails or screws are easily driven into hard wood, if rubbed with a little soap, either hard or soft.

MINERAL RESOURCES OF THE UNITED STATES.

The great metalliferous region of the Union is found between the Missouri river and the Pacific ocean, embracing a little more than half of its whole breadth. The Pacific Railway Company will strike at its western end the gold regions of Colorado, where the annual product of gold is said by the governor to be from five to ten millions of dollars. The Pacific end of the road will extend from the coast accross the Sierra Nevada, and descend into the territory of Nevada at the rich silver mines of Washoe. It is not possible yet to estimate accurately the extent of these deposits of gold and silver; but they are known to exist at very many localities in and between the Rocky Mountains and the Sierra Nevada, not to mention the rich quartz mining regions in California itself. Gold has also been obtained in such quantities from the sands of Snake river, and other confluents of the Columbia, as to attract more than twenty thousand persons to that region. The product from these streams alone for the last year was estimated at twenty millions of dollars.

The Commissioner of the Land Office, in his official report of 1862, describes the gold region of the United States, in the western portion of the continent, as comprising 17 degrees of latitude, or a breadth of 1,100 miles from north to south, and of nearly equal longitudinal extent, making an area of more than a million of square miles. The mountains in this region, he says, are literally stocked with minerals, gold and silver being interspersed in profusion over the immense surface, and daily brought to light, while extensive bodies of agricultural lands, equal to the support of a dense population, are found in the same vicinity.

The yield of the precious metal in this region alone will be probably over a hundred millions a year, increasing with the influx of population for years to come. The commissioner estimates that, with an amount of labor, relatively equal to that expended in California, applied to the gold-fields already known to exist outside of that State, the production of the year, including that of California, would exceed four hundred millions of dollars. In a word, the value of these mines is absolutely incalculable. The coal, iron, tin, lead, quicksilver, copper, etc., of this region are expected to yield, in a few years, an annual revenue half as large as that from the precious metals.—*The Citizen.*

Some statistics of the Morgue, the Parisian dead-house, in which all bodies of unknown persons are exposed for 3 days for recognition, have just been published. They embrace a period of ten years, during which time 3,334 persons (of whom 2,331 were males) have been brought in; 493 of these were newly born infants; $\frac{3}{4}$ths of the whole were identified; 1,544 were between 20 and 40 years of age. The total number of suicides was 1,766, of which 1,414 were by drowning, 115 by hanging, 95 by firearms, 56 with the fumes of charcoal, 46 by leaping from high buildings, 16 by sharp instrument, 11 by poison, 7 by turning themselves under wheels, 4 by brandy and other spirits, The causes of these suicides are given as follows; Insanity, 233; drunkenness, 84; want, 75; pecuniary embarrassment, 64; disappointed love, 62; domestic troubles, 59; delirium tremens, 23.

Prices in the Revolution.—Mrs. John Q. Adams, writing to her husband in Europe, Oct. 15, 1780, gives the following prices of provisions in the colonies at that time:—"Corn is now £30, rye £27 per bushel. Flour £130 to £140 per hundred. Beef $8 per pound: mutton $9; lamb $6, $7, and $8; butter $12 per pound; cheese $10. Sheep's wool $30 per pound; flax $30, Sugar £170 a £200 per hundred; molasses $48 per gallon: tea $90; coffee $12. Cotton wool $30 per pound. Money scarce; plenty of goods; enormous taxes."

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at No. 15 Nassau street, cor. Pine, on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

PROF. C. ELTON BUCK, CONSULTING CHEMIST.

SUBSCRIPTION—Three dollars per annum in advance.

ADVERTISEMENTS.—One dollar per inch in column for each insertion. A discount of 10 per cent. allowed when inserted for three months; 25 per cent. when inserted for six months; and 50 per cent. if for one year.—Payable in advance.

☞ All communications to be addressed to "The Editor," No. 15 Nassau Street, New York.

AGENTS.

Germany.....B. WESTERMAN & CO., of New York.

Great Britain....TRUBNER & CO., 60 Paternoster Row, London.

France.....LE JOURNAL DE L'ECLAIRAGE AU GAZ, 25 Boulevard Poissonnière.

The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, ... EDITOR.

MONDAY, OCT. 17th, 1864.

AGENTS.

NEW YORK—Joy, Coe & Co., No. 1 Spruce street.

PHILADELPHIA—Joy, Coe & Co., No. 441 Chestnut corner of 5th and Chestnut streets.

BACK NUMBERS WANTED.—We want to complete our files of the Journal, the following numbers, for which we are willing to pay full price.

Vol. II—No.'s 13, 22, 24, 25, 29 and 34.

Vol. III—No's 40, 42, 44, 47, 48, 52 and 56.

Vol. IV—No.'s 68, 64, 67, 68, 69, 70, 72, 74, 80, 82, 83.

Vol. V.—No.'s 91, 93, 95 and 96.

Those of our subscribers who do not bind the Journal, would do us an especial favor by forwarding to us any of the above numbers. We are being constantly called upon to furnish back issues of our paper by those who value it for future reference, and we have supplied them until all of the above numbers are exhausted.

A NEW ALLOY.—A new alloy, described as applicable to the manufacture of all metal articles, bells, hammers, anvils, rails, and non-cutting tools, has been patented by Mr. M. H. Micolon, of Paris. The alloy consists of iron with manganese or borax. The patentee takes 20 parts of iron turnings or tin waste, 80 parts of steel, 4 parts of manganese, and 4 parts of borax; but these proportions may be varied. When it is desired to increase the tenacity of the alloy, two or three parts of wolfram are added.—When the cupola is ready, the iron and steel are poured in, and then the manganese and borax; finally, the vessel is filled up with coke; the metal is thus in direct contact with the fuel in the cupola, and by quickly running the fused mass into moulds bells which possess the sonority of silver, whilst the cost is less than bronze may be obtained.

Windows may be kept free from ice by painting the glass with alcohol with a brush or sponge.

Pigeons are hatched in 18 days; chickens, 21; turkeys, 26; ducks and geese, 30.

OUR CHANGE OF TITLE.

Our readers will observe the change of title to our Journal. The reasons for it are various, and we believe our friends will all approve of it Having determined to give attention to MINING INTERESTS and to the absorbing and truly interesting subject of PETROLEUM, it seemed proper that our title should indicate the character of the Journal more distinctly than the original name expressed. To those especially interested in gas light and its incidents we will say that we shall not neglect that department. The new field we have taken will give us a great additional circulation, and makes the Journal more valuable as an advertising medium, and far more interesting as a reading paper.

THE GREAT MINING ERA.

We can but look forward to the astonishing and rich developments of the great mineral products of our country, with confidence that the time is not far distant when the value will be double or treble that of the present day. The mighty powers of science, capital and labor are engaged in bringing forth the riches from Natures' great storehouse, with resistless energy, and millions and millions of undiscovered treasures will be brought forth; confidence will take the place of the present supineness and doubt, and companies will be organized of such substantial character with men of undoubted integrity and worth at the head of affairs, as shall draw around them the capitalists of our country. We are led into these remarks by the following extract which we take from the *American Exchange and Review*.

We are entering upon a great mining era—an era whose prospective grandeur has fostered the belief in the minds of some that the future yield of metals and minerals will retrieve the economical loss of the present rebellion. Fresh metallurgical processes are increasing the value of every metal-bearing rock East of the Mississippi, newly discovered veins and beds are to be worked, and some, which have been abandoned, will be re-tested. There are valuable metal lands between the Mississippi and Missouri rivers. From the 26° of longitude west to the Pacific from the southern line of Arizona to British America, mighty mountain ranges, far-extending sierras, emboweling various ores and native metals with more or less concentration, crowd together. Here the pioneer adventurer has touched the surface, perhaps in spots exhausted the auriferous driftings into valleys and stream beds, but it cannot be said, excepting with qualification, that the miner has fairly come with his shafts and levels. Now, however, more regular workings are at hand. It is true that east of the Mississippi the past has brought much disappointment to the workers of the mineral lands, yet iron, coal, petroleum and sectional areas of lead and copper have prosperous records. Perhaps, here the future may add other such great exceptions to the poverty of deposits, as the native copper of Michigan, and the chrome-bearing serpentine of the Susquehanna region, and such fair ones, as the nickel and zinc of Pennsylvania.

The proper investment of capital in mining enterprises is now of great moment—as wasted money is not only taking from the development of our mineral resources, but it debars further investment. We shall, therefore, especially endeavor to furnish the capitalists with such information as he can turn to practical advantageous account.

Never condemn your neighbor unheard; there are always two ways of telling a story.

THE PHILOSOPHY OF BATHING.

There are in the human body 2,700,000 glands and 7,000,000 pores, from 2 000 to 3,000 to the square inch, and one-eighth of an inch in depth—making twenty-eighth miles of human drainage!

Five-eights of all that is eaten passes off through these pores, and but one per cent. of all the perspirable matter consists of solid substances. The change in the muscles, tissues and bones occurs in from one to three years, and in the entire body in from six to seven years. If this old matter be retained, it causes disease—it is a real virus.

Some diseases are relieved almost instantly by opening the pores. Diarrhœa is frequently cured; matter from mucous membrane is expelled through the skin; tobacco, opium and mercury have been thus excluded. Whatever through the skin the body can expel, it can absorb. Hold the end of your finger in spirits of turpentine—it is absorbed; goes through the system, and may be detected by its odor. Constant handling of arsenic has produced death by absorption.

The doctor relates an account of a gentleman in Barbadoes, who was in the habit of daily intoxication, and had constructed a tub, with a pillow to accommodate his head, and when in this state was placed therein, and the tub was filled with cold water, in which he reposed for two or three hours, and would then arise refreshed and invigorated. When his wife or family required him, they would wake him up by taking out the plug, and allow the water to escape, when he would pleasantly complain of the "loss of his bedclothes."

Dr. Crook, a student of Sir. Astley Cooper, once poisoned a dog, which immediately plunged into a neighboring river, and remained for some time with his body entirely submerged, after which he left his watery hospital and ran home cured. Dogs have been repeatedly cured of hydrophobia by holding them in water.

Thirst has often been relieved by immersion, even in salt water, the salt, probably being excluded during the process of transudation. Button bones, boiled a long time in soft water, with a slight addition of calcined potash, made fresh every day, have imparted to the water such nourishing properties that the patient bathing therein daily, and taking nothing save a few teaspoonfuls of tea twice a day, and one tablespoonful of tonic syrup, gained 15 1-2 pounds in as many weeks, simply by absorption.

Perspiration is eliminated from all parts of the body, and the excretions, cutaneously forced, may from some parts of the surface, be re-admitted to the circulation, and if poisonous or injurious, whenever the blood visiti it, it must carry disease. Nature keeps her side of the interior clean and soft, and demands an unobstructed exterior, and exudes to the surface the refuse matter for removal by bathing and evaporation. A dry, light powder, mixed with sweat and oil from the glands, and dust, clogs upon the pores. As all parts of the cuticle have pores, as well as the face and arms, all the body should be bathed at least one-third as many times as those are.

On board a slave-ship the small pox suddenly broke out. Medical aid was powerless. Every morning the dead in great numbers were thrown overboard. In the midst of terror and anguish, the negroes cried out, "Let us do as we do in our own country with the sick," and permission being given, they gently lowered their sick companions into the sea, letting them remain a few minutes, and raised them, and placed them in the sun-light on deck until dried, when the disease left them and they were cured.

At Charleston, S. C., during the recent epidemic, among several northern mechanics who had gone

thither in company, but one escaped the prevailing fever, and he alone bathed frequently, and never slept at night in any of the clothes worn by day. The others cast off only the outer garments, slept in their perspiration, and died.

Cold water is used and prescribed much more than formerly, though many would think a physician not worth sending for who should prescribe so simple a remedy. Abernethy's advice to one of his wealthy patients was—"Let your servent bring to you three of your pailsfuls of water and put it into a washtub. Take off your clothes, and get into it, and you'll recover." "This advice of yours seems very much like telling me to wash myself," said the patient. "Well," said Abernethy, "it is open to that objection."

Dr. Currie used fresh water generally, and by long and careful experience, he found that bathing prevented or cured most diseases.

BUTTER AS A REAGENT FOR COPPER AND ITS COMPOUNDS.

By E. Lancelot, Pharmaceutist, Chatillon, (Indre.)

I take the opportunity of the Scientific Commission now meeting at the Vienne (France), to communicate to my fellow pharmaceutists a fact which I believe, is new to the science of chemistry, and may ultimately prove highly interesting as a question of hygiene and toxicology.

Some time ago, an inhabitant of our city had a copper hydrant put up in his yard. The inner part of the copper pipe had not been tinned, that precaution being commonly deemed superflous.

The water supplied by this hydrant for the usual wants of the household, had never been suspected of containing noxious matter; but, one day, the lady of the house told her husband that, having left a slice of butter for several days in water drawn from the new hydrant—the water having been renewed five or six times,—she found that the immersed surface of the butter had turned quite green.

Anxious to ascertain the cause of this singular alteration, the proprietor divided a pound of butter into three equal parts, and placed them separately in three different vessels. He then filled one of these with water taken from a wooden hydrant placed in his yard at some distance from that of copper; the second vessel was filled with water from the very well that supplied the copper pipe, but, from the outside of that pipe; and the third vessel contained water that had passed through the copper pipe itself.

The butter deposited in the water of the third vessel was the only one which, after two days' immersion, became covered with a bluish green color, exhibiting the aspect of an hydrate of deutoxide of copper.

The piece of colored butter was handed to me by the owner, with a request to experiment chemically upon it, so as to ascertain the true nature of this coloration.

A solution of hydro sulphuric acid applied to the butter, produced at once a blackish dirty spot; and the ferro-hydrocyanate of potassa gave a crimson spot; the latter grew darker by degrees. These characteristic aspects left no doubt of the presence of copper.

Desirous of experimenting upon the very water that had imparted such a color to the butter; and also of determining what proportion of copper it might contain, I requested the owner to send me a certain quantity of that water, especially that which would be the first drawn in the morning. He sent me about three gallons of it, one quart of which was tried by means of the above mentioned reactives, and some well known others, but without any result.

The remaining eleven quarts were reduced by evaporation to a tumbler full Having filtered that remnant, I tried the limpid liquor: no result. I next poured on the filter—now coated with a calcareous deposit—a few drops of reagent: again without result. Finally, I dissolved this deposit in nitric acid, and then neutralized the solution; but that was as unsuccessful as the other trials.

Now, what conclusions can be drawn from the above? Simply this: That butter may fix and reveal molecules of copper, so very minute, that they will evade the most sensitive reagents known. Another remark is, that none of the persons who had used the water of this hydrant had ever experienced the slightest accident. Nevertheless, my experiments lead me to the following conclusion: That under certain circumstances—as, for instance, the washing of butter,—water from copper hydrants may become deleterious unless the pipes be tinned inside.

It has long been known that the acids contained in greasy substances will act promptly on copper: but the above experiment has demonstrated to me, that butter is perhaps the most sensitive reagent to detect the presence of that metal, or of its salts, in a liquid; and that, if iron has the property of reducing the salts of copper contained in a very diluted solution, butter itself possesses the property of forming a copper salt—perhaps a butyrate—which reveals the presence of that metal, even when the active reagents most in use have failed to give us traces of its existence.

I leave to the masters of the science the care of completing these experiments, which are certainly not devoid of interest in a toxicological point of view.—*Philadelphia Journal of Pharmacy from L'Union Pharmaceutique.*

PETROLEUM REVIEW—October 15th.

New York, Oct. 15th, 1864.

Crude.—Since my last has advanced from 37 a 38 to 45 a 47 cts. The latest sales I notice are 1000 bbls. 40° a 47° gravity, at 45 cts, and 500 bbls 40° a 45° at 47 cts., also 1000 bbls 5. 0. all the month at 48 cts.

Refined.—In bond is in more demand at advanced prices. I notice sales of 475 bbls light straw 60 cts; 800 bbls straw 55 cts, 3000 bbls light straw to white 65 cts, 1000 bbls white, 68 cts. The market closes firm. Free oil has advanced with considerable excitement, and is selling at the close price 80 to 82 cts. Oil in tins for export, is selling in bond, from 80 a 82 cts, and free 95 cts to $1.

Naptha.—Is dull.

Remarks.—In consequence of the rise in gold, all descriptions of Petroleum are higher. There is very little demand for free oil, and from appearances the export demand will fall off. The arrivals for the past two weeks are 35,455 bbls. The exports for the same time 1,632,876 galls., and since January 17,242,211 galls.

B. L. HARSELL.

Commission Merchant,

132 and 134 Maiden Lane, N. Y.

Solubility of Parraffine.—Aug. Vogel has determined the solubility of paraffin in benzol, chloroform, and sulphide of carbon. The paraffin experimented with melted at 48° C., and congealed at 45°. The benzol had the specific gravity 0·887. One part of benzol at 46° C. dissolved 7·7 parts paraffin.

43°	"	5·0	"
39°	"	4·0	"
23°	"	0·7	"
20°	"	0·3	"

Solubility in Chloroform.—One part of chloroform at 23° dissolved 0·22 parts paraffin. One part of chloroform at 20° dissolved 0·16 parts paraffin.

Solubility in Sulphide of Carbon.—One part of sulphide of carbon at 23° dissolved an equal weight of paraffin.

Comparative experiments with stearic acid showed that one part of benzol at 23° C dissolved 0·22 parts of stearic acid; and one part of sulphide of carbon at 23° dissolved 0·3 of stearic acid. This acid is consequently less soluble in the above menstrua than paraffin. A mixture of stearic acid and paraffin fused together did not separate from these solutions in a homogeneous mass, but in two layers, the stearic acid appearing in distinct crystals. This may suggest a method of recognising the presence of stearic acid with paraffin.

NEW YORK MINING EXCHANGE.

New York, Oct. 15, 1864.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Azte	7⅜	9	Benton	1	1¼
Bedford	1	1⅛	Consol'd Gregory	25	28¾
Boston	4⅜	5¾	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3¾	4¼
Canada	3¼	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls	34⅜	38	Mariposa	44	44¾
Clifton	—	$1	Montana	⅜	1
Dacotah	—	5⅜	New York	2⅜	3
Derby	⅞	1⅛	N. Y. & Nova Scotia	¾	1¼
Douglass	—	—	Quartz Hill	9¾	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13⅜	Rocky Mountain	—	10⅜
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12⅜	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8¾	9¼	Del & Hud. Canal	206	208
Isle Royale	20	20⅜	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	¾
Mendota	—	—	Clute	1⅛	1⅞
Merrimac	4¾	5⅜	Erie	—	20
Minnesota	33	37	Macomb	3¾	5
New York, A. P.	2	3⅜	Plancentia Bay	1¾	1¾
N. J. Consolidated	4	4⅜	Sussex	¾	⅞
Norwich	—	6	Wallkill	3⅛	6
Ogima	5	6¾			
Ontonagon	3	4⅛	***Iron Stocks.***		
Penn	—	11⅜	Copake	8	10
Providence	1⅜	2	French Creek	⅞	1
Quincy	96¾	98	Teal Lake	4⅜	6
Reliance	1¾	2¾			
Rockland	12⅜	14	***Miscellaneous.***		
Superior	8⅜	9	Rutland Marble	17	20
Sharon Consolidated	—	3	* *Ex. div.*		

The Iron Age.—We have received the first number of a new weekly paper, which has the above title, and bears all the appearance of being conducted with a skillful hand. As its title indicates, it is devoted to the Iron and Hardware interests, the exposition of the industrial resources and capacity of the United States, and to promote American industry and production. We wish the enterprising and talented projector success in his undertaking, and recommend those whose interests he so ably and earnestly advocates to patronise him—The subscription price per year is $4.

To Advertisers.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

ROBBINS' PATENT
GAS AND WATER JOINT.

THE PROPRIETORS of this unrivalled joint are now prepared to introduce it to general use, and to guarantee that, in all respects, it will fulfil perfectly all the requirements of either water, gas, or steam. It is a joint which remains in all situations absolutely tight.

The following illustrations, with the appended explanations, will give a good idea of the improvement:

Fig. 3.

Fig. 1.

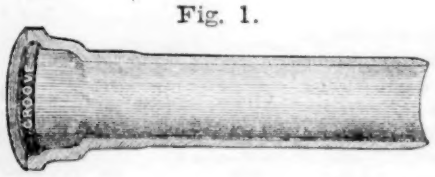


Fig. 2.

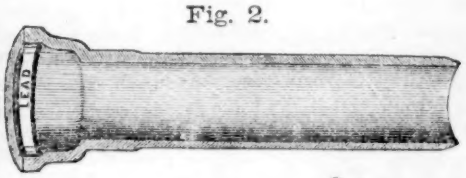


Fig. 4.

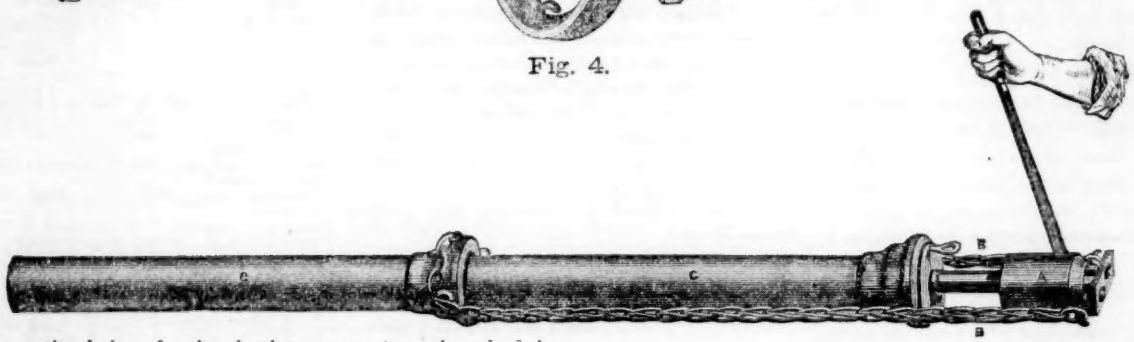


FIG. 1. Is a sectional view of a pipe showing a groove to receive a lead ring.

FIG. 2. Is a sectional view of a pipe showing a lead ring in the groove.

FIG. 3. Represents a former, which is used in the bell end of the pipe while casting the lead ring. Before using the former, however, a strip or belt of India rubber is first inserted in the socket, against which the former rests to prevent the lead escaping from the groove while being cast. Upon the cooling of the lead, the former and rubber ring are withdrawn from the socket, and the lead ring is left projecting inwards from the groove all around, forming an indestructible packing to receive the spigot-end of the pipe.

FIG. 4. Shows two pieces of pipe in connection with an hydraulic jack, by which the spigot-end of the pipe (which is cast tapering and may be cast in a chill), is forced into the lead ring in the groove which perfects the joint. A, represents the jack; B, B, the chains by which the pipes are drawn together; and C, C, pieces of pipe.

This ring joint packing may be cast at the foundry or any convenient place, and when delivered at the ditch, may be laid, and perfect joints formed, by any laborer, above or below the surface, or in ditches filled with water, there being *no joint ditching required*, and it can be laid with very great rapidity.

Among the economies realized by this joint may be enumerated, the saving in the weight of the pipe, in the amount of lead required to be used in forming the packing, in the labor of ditching, and in laying the pipe.

The bell or socket may be cast one-half the usual length, as the width of the groove requires, but from a half to one and a half inches, according to the size of the pipe, thus saving in the total weight about two hundred pounds per ton.

The weight of lead required to form this joint, as compared with the amount of lead used in forming a joint according to the old method, is fully seventy-five per cent. less, only so much being required as to maintain the compensating principle, or enough to allow (upon the raising or depressing of the line of pipe out of a direct line) what is lost upon one side of the ring packing, to take its place upon the other; thus securing flexibility of the joint without affecting its reliability. The use of yarn or hemp packing is dispensed with, the cost of which is an entire saving as compared with the old method of making joints.

The saving of labor in ditching is the total amount usually expended in digging joint-holes, there being *no joints to be caulked.*

The saving in labor in laying pipe furnished with this joint is a sum equal to the whole cost of carrying lead, fuel, ladles to the ditches, casting the lead, bailing out water, and the entire labor of caulking, less only the sum charged for casting the lead ring packing at the foundry, which is comparatively trifling. This last-mentioned economy has been estimated by the best engineers at seventy-five per cent., or the same as the saving in the quantity of lead used.

The cost of pipe cast from our patterns is the same per ton as pipe cast for the old form of joint. The principal iron-founders propose to charge the same price.

We have submitted these joints in water-pipes to a pressure of two hundred and fifty pounds to the square inch, and they have remained perfectly tight. It has also been submitted for months in gas-pipes to the ordinary pressure of our city gas-mains, without any leakage whatever. We are aware that these statements may be deemed by many extravagant, but the merits of the improvement warrant them all, and the most skeptical may be fully convinced by an investigation of its value, and by witnessing the tests to which we submit it, or by its use under any conceivable circumstances.

TESTIMONIALS.

OFFICE OF THE WATER COMMISSIONERS,
CITY HALL, JERSEY CITY, October 14th, 1863.

Dear Sir,—On the 26th of May last, about two hundred and sixty feet of cast-iron water pipes, six inches in diameter, with joints constructed according to your invention, were laid for the Jersey City Water-Works, in Prospect street.

The operation of uniting the joints of the pipes, was performed with remarkable facility, and with an important saving in time, materials, and labor. The joints proved perfectly water-tight, after turning the full head of water on the pipes.

In my opinion, your invention has proved entirely successful, and will be found highly beneficial to water companies.

Yours, respectfully,
ROBT. C. BACOT,
Superintendent and Engineer, Jersey City Water-Works.

MR. R. C. ROBBINS.

ENGINEER'S OFFICE, CROTON AQUEDUCT DEPARTMENT.

Dear Sir,—I have examined your plan for making joints in cast-iron water pipes, and have a report from one of my assistants, of certain experiments made by you, to prove the certainty and economy with which the joints can be made, and their stability when finished.

I think the experiments showed that the joints could be made quite as rapidly, if not more rapidly, than those made in the ordinary method now in use; the quantity of lead used was less than that required in the common joint, and no yarn packing was required. In these respects, your joint seems superior.

After the joints were made, a pressure of three hundred pounds to the square inch, was put upon the pipe in such a manner as to test the efficiency of the joint to prevent both leakage of water, and separation of the pipes from each other longitudinally. This pressure failed to produce either leakage at the joint, or separation, so long as the pipes lay in a direct line; but on deflecting them six and a half inches, in a length of twelve feet, the joint commenced leaking. It is fair to add, that this is a greater deflection than would often be found necessary in laying pipe.

I think the efficiency of the joint in both the points tested in this last experiment, might be increased by increasing the quantity of lead, both in thickness and width.

Altogether, the result of the experiments was such that I have determined to make a more thorough test of your invention by putting down about one thousand feet of pipe, when we commence our operations for the coming season.

The diameter of the pipe subjected to experiment, was six inches, and is the same size that I propose to put down next year.

I am, very respectfully, your obedient servant,
A. W. CRAVEN, Chief Engineer, &c.

To R. C. ROBBINS, Esq., Jersey City.

METROPOLITAN GAS-WORKS,
ENGINEER'S OFFICE, NEW YORK, October 9th, 1863.

Dear Sir,—The undersigned had the pleasure of being present at an experimental test of your patent joint for gas and water pipe, made at the yard of the Croton Aqueduct Department, and cheerfully testify to the results obtained, namely:

First experiment was made with two lengths of eight-inch pipe, jointed together, when a pressure of three hundred pounds to the square inch was applied. This pressure did not force the pipe apart, nor start the joints, but they remained, during this experiment, perfectly tight.

Second experiment was made by deflecting the pipe five inches, which is about equal to eighteen inches in one hundred feet, and the same pressure applied, which caused a small leak at the joints.

Third experiment was made by taking the pipes apart and rejointing them, when the same pressure was applied when lying straight and when deflected; at this experiment there was no leakage.

From these severe tests it is my impression that the superiority of your patent joint has been made manifest, and that it must eventually supersede the old way of jointing pipes together, saving both time and material.

Wishing you success in your enterprise,

I am, very respectfully, yours, &c.,
AMBROSE J. WHITE, Engineer.

To R. C. ROBBINS, Esq.

OFFICE OF THE METROPOLITAN GAS-LIGHT COMPANY,
NEW YORK, October 9th, 1863.

Dear Sir,—Having been present at the testing of your patent joint for gas and water pipe, at the yard of the Croton Aqueduct Department, I can testify to the results as stated by Col. A. J. White and fully concur with him in the opinion expressed in his letter to you of this date.

Very respectfully, yours,
W. TITUS, Secretary.

R. C. ROBBINS, Esq.

NEW YORK, October 23d, 1863.

Gentlemen.—I am pleased to be able to inform you, that we are fully satisfied that we have done well in adopting your "Improved Joint," in the construction of an aqueduct which we are now building on Oil Creek, Northwestern Pennsylvania.

We have ten miles of three and four inch pipe to lay this season, and, in our estimation, the perfection of the joint, economy in lead, and rapidity with which the pipe can be laid, render it entirely preferable to any other method of laying pipe.

Our Mr. Hutchings advises us that he is putting down the three and four inch pipe at the rate of twenty-five to thirty lengths per hour, with two men in the trench. We are much pleased with this result.

Respectfully yours,
HUTCHINGS & FOSTER.

Messrs. R. C. ROBBINS & Co.

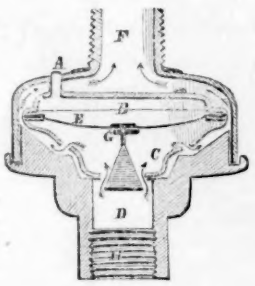
For further information, or for prices and terms, which will be very reasonable, apply to

R. C. ROBBINS & CO.,
No. 218 FULTON STREET NEW YORK

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SANDS, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y.
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the manufactory, 52 Greene street, where they can see the operation by pressure guage and test meters.

M. L. CALLENDAR, Agent,
Office, 52 GREENE STREET.

THE AMERICAN METRE CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

512 WEST TWENTY-SECOND STREET, NEW YORK,
ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA,
1 BARRETT STREET, BOSTON, will meet with prompt attention.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices. Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
179 BROADWAY, N. Y.

GEO. H. KITCHEN & CO.,
NEW PATENT
GAS APPARATUS
For Country Residences, Public Buildings, &c.,
FROM $300 UPWARDS.
EVERY DESCRIPTION OF GAS FIXTURES.
Gas Fitting in all its branches.
561 Broadway,
NEW YORK.

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty third streets, Philadelphia.

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

GLYCERIN
FOR
Filling Wet Gas-Meters,
Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and Coke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.

Office 64 Sycamore.
Agent in New York, Paul Balluff, 95 Maiden Lane

To Gas Companies.

A YOUNG MAN, FROM ENGLAND, thoroughly educated, and who has had nine years experience in the Newcastle-under Lyne Gas-Works, England, as an assistant Manager, desires a similar situation in some Gas-Works in the United States. He has credentials of capacity for such a position.

Address, M. C. P. LAWTON,
Office GAS-LIGHT JOURNAL

WOODEN PURIFYING TRAYS.

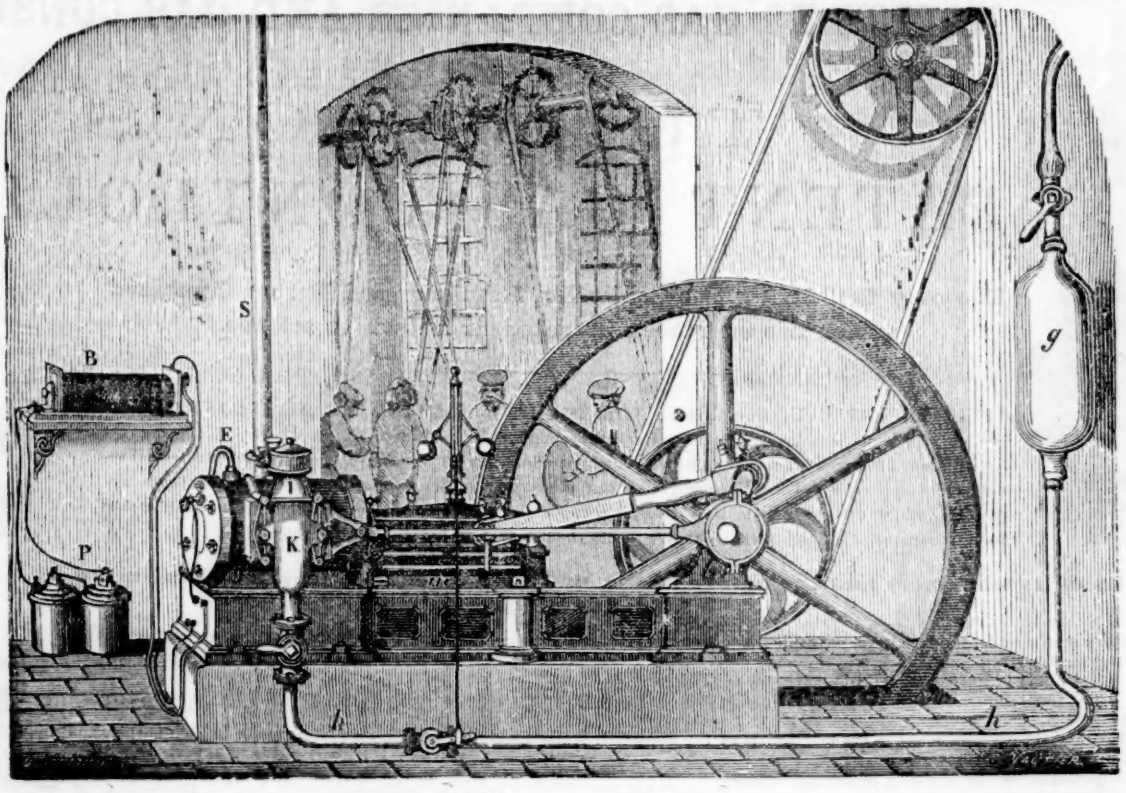
PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.
CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago,
Louisville,
And numerous others

Orders received by mail or otherwise.

JOHN L. CHEESMAN,
147 Ave. C, New York City.



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end ot the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the brass cock manufactory of Mr. A. Carr, *No.* 135 *Mercer St, between Prince and Houston Streets,* New York where those interested are invited to call and examine them.

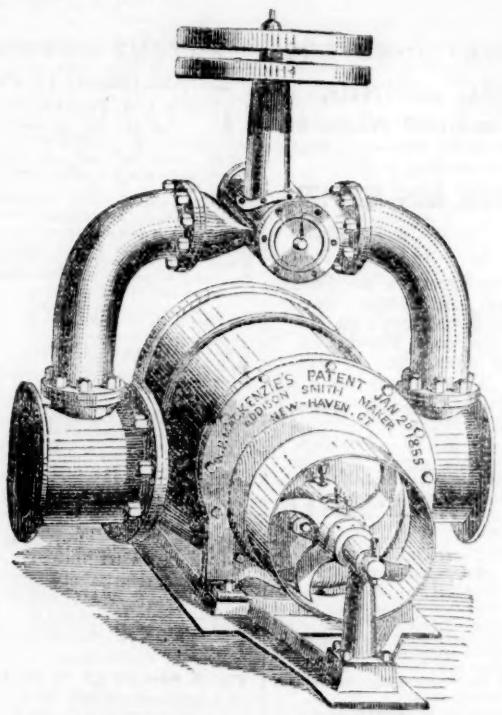
THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.



SMITH & SAYRE,

Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel Address SMITH & SAYRE, 458 Broadway, New York.

HARRIS & BROTHER,

PRACTICAL GAS METER MANUFACTURERS,

Continue, as heretofore, at their old Establishment,

No. 1117 CHERRY ST., PHILADELPHIA,

TO MANUFACTURE

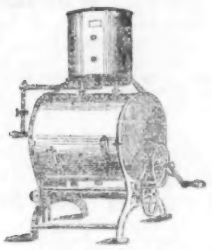
WET AND DRY GAS METERS (Consumers'),
STATION, EXPERIMENTAL AND SHOW METERS,
GLAZED METERS, METER PROVERS, AND PHOTOMETERS,
GOVERNOR AND CENTRE SEAL DRUMS,
FLUID AND PRESSURE GUAGES,
PRESSURE REGISTERS AND INDICATORS, &c., &c., &c.

All our work warranted. All orders addressed to
HARRIS & BRO., 1117 Cherry Street, Philadelphia.

DRAKE'S

PATENT

AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient,
Simple, and
Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

These Machines are manufactured in Boston, by the AUTOMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington Street, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York

For further particulars, address—

MITCHELL, VANCE & CO.,
620 BROADWAY, NEW YORK CITY.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents, and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agents—S. R. WILLIAMS, 204 South Front st., Philadelphia.
CALVIN GAY, 29 Doane st., Boston.

THE

STANDARD Gold Company

OF COLORADO.

DIRECTORS,
ROBERT BOWNE,
EDWARD WILLIS,
LIVINGSTON SATTERLEE,
ETHAN ALLEN,
S. A. BANKS,
SYLVESTER TAYLOR.

President, ROBERT BOWNE.
Secretary, F. A. MITCHEL.

MINES on FISK LODE,
BOBTAIL LODE,
GROUND HOG LODE,
ENTERPRISE LODE,
and others,

In all, 8,625 feet (linear), and large water powers and mill sites.

Capital issued, 40,000 shares, at $10 per share.

A limited number of shares are offered at the low SUBSCRIPTION PRICE (having been reserved for their customers), by

WILLIAMS & MITCHEL, 12 Wall Street.

SAFEST AND CHEAPEST SYSTEM OF INSURANCE.

WASHINGTON

INSURANCE COMPANY,

172 BROADWAY,

Cor. Maiden Lane, NEW YORK.

CASH CAPITAL, - - - $400.000.
Assets, June 1, 1864, - - - 600,000.

Scrip Dividend, 1863, - - 60 per Cent.
Scrip Dividend, 1862, - - 60 per Cent.
Scrip Dividend, 1861, - - 60 per Cent.

The Policies entitled to participate receive 75 per cent. of net Profits.

Insures Buildings, Merchandise, Furniture, Rents, Leases, against loss or damage by FIRE, and MARINE RISKS on LAKES, RIVERS and CANALS.

GEO. C. SATTERLEE, President.
HENRY WESTON, Vice Prest.
WM. K. LOTHROP, Secretary.
WM. A. SCOTT, Ass't Secretary.

SATTERLEE & CO.,

BANKERS

AND

STOCK BROKERS,

49 Exchange Place,

NEW YORK.

G. B. SATTERLEE, H. TRACY ARNOLD,
H. A. BOSTWICK, LIVINGSTON SATTERLEE.

Mining Stocks bought and sold at the Regular, Mining, Boston and Philadelphia Boards.

ALBERT H. NICOLAY,

STOCK BROKER AND

AUCTIONEER,

No. 52 William Street,

NEAR WALL ST., NEW YORK.

Special attention given to the Buying and Selling of Gas-Light Companies' Stocks.

PARTICIPATION.

ÆTNA FIRE INS.

COMPANY OF NEW YORK,

No. 170 Broadway.

CASH CAPITAL, $200,000. CHARTERED 1824.

The insured receive seventy-five per cent. of the net profits annually, without incurring any liability. When preferred, a discount will be made in lieu of participation in profits.

Scrip Dividend of 1861, - - 50 per cent.
Scrip Dividend of 1862, - - 50 per cent.
Scrip Dividend of 1863, - - 50 per cent.

JACOB BROUWER, *President.*
H. C. BEACH, *Secretary.*
WM. H. BARBOUR, *Asst. Sec.*

Carrington & Co.'s
GENERAL
PURCHASING AGENCY,
In Connection with all the Expresses,
No. 40 Broadway,
NEW YORK
Established 1854.

Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a seal-ring to a steam-engine.

Goods purchased at current City prices, and forwarded by Express, or as directed.

Commission, Five Per Cent.

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

SPECIAL CIRCULAR.

The Adams Express Company, appreciating the need of a capable medium connecting with the various Express Lines, through which personal and other orders for goods from this city, can be satisfactorily supplied, do recognize CARRINGTON & CO'S GENERAL PURCHASING AGENCY as such medium for filling orders for every description of goods wanted from New York, and commend it to the attention of the public, and of our general and local agents, recommending our agents to extend to it all reasonable aid, by facilitating the distribution of its cards and circulars, and making known the advantages it affords.

ADAMS EXPRESS CO.
By W. B. DINSMORE, Prest.
NEW YORK, June, 1864.

We cheerfully concur in the above recommendation of the Adams Express Company.
AMERICAN EXPRESS COMPANY,
By HENRY WELLS, Prest.
UNITED STATES EXPRESS COMPANY,
By D. N. BARNEY, Prest.
WELLS, FARGO & CO.,
NATIONAL EXPRESS COMPANY,
By J. A. PULLEN
HARNDEN EXPRESS,
By L. W. WINCHESTER, Supt.
KINSLEY & CO.'S EXPRESS,
By E. LITTLEFIELD, Supt.
HOPE EXPRESS COMPANY,
A. D. HOPE, Supt.
BREESE & CO.'S EXPRESS,
By STEPHEN BREESE, Supt
NEW JERSEY EXPRESS COMPANY,
By GEORGE R. DUNN, Supt.

SCHMIDLIN & DRISCOLL,
MANUFACTURERS OF
HALL, STREET & CHURCH LANTERNS,
Show Window and Street Lamp Reflectors,
135 Mercer Street,
NEW YORK.

LAFARGE, & CO.,
BROKERS,
4 Wall St., (2d floor) *New York.*
STOCKS, BONDS,
AND OTHER SECURITIES
Bought and Sold
ON COMMISSION.
L. LA FARGE, G. I. GERRARD.

JOHN MOSS, Jr.,
BROKER,
219 DOCK ST., PHILADELPHIA,
Particular attention given to the negotiation of GAS-LIGHT and WATER COMPANIES SHARES and BONDS.

IRON FOUNDRIES.

MORRIS, TASKER & CO,
PASCAL IRON WORKS,
[ESTABLISHED 1821.]
PHILADELPHIA.
Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, Bush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. COPE.
SOUTHWARK FOUNDRY,
FIFTH & WASHINGTON STREETS,
PHILADELPHIA.
MERRICK & SONS, Engineers,
MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas-holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings,
and Machinery generally.

PROTECTED WROUGHT-IRON WATER & GAS PIPE.
HYDRAULIC CEMENT SEWER PIPE,
KNIGHT & WOODWARD,
Office, Cor. READE & CENTRE STS., New York.
Sewer Pipes extensively used in Brooklyn, and now introduced in New York, Jersey City, Newark, Hartford, Albany, and other localities, from 3 to 24 inches in calibre.
Water Pipes, lined and coated with Cement mortar, ready for laying and back filling, and can be tapped like cast-iron pipes, which they excel in durability, discharge, and economy.
Factory Cor. Bond & Union sts., Brooklyn.

CLARK'S PATENT STEAM AND FIRE REGULATOR Co., sole Patentees and manufacturers of CLARK'S PATENT STEAM AND FIRE REGULATOR, No. 5 PARK PLACE, New York.
W. H. PERRINE, Pres.

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.
SAMUEL FULTON, THEO. TREWENDT.

Gas Companies and Plumbers!
DRIP PUMP.
PRICE $12.
This illustration represents our new style of DRIP PUMP, designed particularly for the use of Gas Companies and Plumbers The Cylinder, Rod, and Plunger are made of Brass. Without doubt, they are the best and cheapest article in market. Try one!
Seneca Falls Pump & Fire Engine Mf'g Co.,
SENECA FALLS, N. Y.

GAS & WATER-METERS

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

H. R. WORTHINGTON'S
PATENT WATER-METER.
This Meter combines
ACCURACY, SIMPLICITY, and
REMARKABLE DURABILITY,
with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

GAS-FIXTURES

Mitchell, Vance & Co.
MANUFACTURERS OF
CHANDELIERS,
And every description of
GAS FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
MANUFACTORY,
Nos. 335, 337, 339, 343 WEST 24TH STREET,
New York.

"HER MAJESTY"
CHAMPAGNE.
THE ROYAL WINE OF ENGLAND.
A limited quantity of this delicious and superior Wine has been secured for the undersigned, and the first shipment of 500 cases has arrived this day, by the steamship "Olympus," from Havre.
It comes direct from the cellars of the well-known house of Messrs. DE VENOGE & CO., at Epernay, France, and the present invoice will be introduced into this market at the very low price of
Thirty Dollars per Case of Quarts.
Payable in currency, which is much below its actual first cost.
The superior quality of this Wine is guaranteed, and it is offered with every confidence of its entire approval by connoisseurs, and lovers of a fruity, full-body wine.
Orders for one or more cases may be addressed, by letter or otherwise, to the undersigned,
WM. HENRY WARD,
Quarts, $30. No. 7 Broad st., near Wall,
Pints, $32. New York.

THE AUBIN
GAS-WORKS COMPANY,
Of Albany, N. Y.,
Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.
Many Village Gas Companies can be referred to.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.
To Manufacturers of Petroleum Gas.
For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.
Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

PATENT AGENCIES.

ESTABLISHED 17 YEARS.
OFFICE FOR THE PROCURATION of Letters Patent and the Registration of Designs. JOSEPH WILLCOCK & CO., Patent Agents and Engineers, successors to Messrs. BARLOW & Co., 89 Chancery Lane, London, W. C.
Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.
The second part is approaching completion and will shortly be announced.

F. C. TREADWELL, JUNR.,
SOLICITOR OF PATENTS,
385 BROADWAY
(Moffat's Building,) New York.

AMERICAN AND FOREIGN
PATENT AGENCY,
Established 1838.
Letters Patent for New Inventions procured in the United States, Great Britain, France, and other countries. LEMUEL W. SERRELL,
119 & 121 NASSAU ST., New York.

GAS-BURNERS.

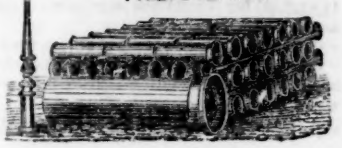
T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
late No. 447 BROOME ST.,
New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' PROVING APPARATUS, &c.
No. 111 South Eighth St.,
Philadelphia.

THE ALPHA TUBE WORKS
WALSALL, STAFFORDSHIRE, ENGLAND;
ESTABLISHED 1830.
LAMBERT BROTHERS,
MANUFACTURERS OF
Lap-welded Boiler Tubes Locomotive and Marine Engine Fittings,
PATENT ECONOMIZING
GAS-BURNERS,
Regulated to burn without noise or fluttering at sixth-tenths to eighteen-tenths pressure. Last twenty Scotch tips. Price from 8s. to 40s. per gross; liberal allowance to wholesale buyers. Any size for any gas (coal, wood, or cannel) screw either taper s/8, s/4, or plug.

H. P. GENGEMBRE'S
PATENT
NON-FREEZING & NON-EVAPORATING FLUID,
For Filling Wet Gas-meters,
AND
Far Cheaper than any other Meter-fluid in use.
WARRANTED
Not to corrode tin, iron, brass, zinc, or drum-metal.
To be less injurious to wet meters that water.
Not to freeze at 20 degrees below zero, Fah.
Not to evaporate when in use in the meters, meters once filled with it requiring no further attention whatever for years.
The summer is the proper time to fill them.
SIX YEARS OF SUCCESS!
Five years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend our patent with perfect confidence.
For information and references, apply to
GENGEMBRE & DOISY,
Box 1,160, Cincinnati, O

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Professor HENRY WURTZ,

FORMERLY OF THE N. J. GEOlogical Survey, Chemical Examiner in the U. S. Patent Office, etc., etc., makes CHEMICAL ANALYSES of all kinds, Examinations of MINES and MINERAL LOCALITIES, CHEMICAL RESEARCHES on all subjects connected with MINING, METALLURGY, GAS, and Chemical Manufactures generally; and gives his services as a CONSULTING CHEMIST and SCIENTIFIC EXPERT on all subjects, including PATENT CASES. Refers to Dr. Torrey, U. S. Assayer, N. Y.; Prof. Silliman, Yale College; Dr. Wolcott Gibbs, and recognized men of science generally.

Prof. W. can be seen or addressed at this Office 15 Nassau street, until 3 P. M., and after 3 at h residence, 108 Bleecker street.

NEWSPAPER WRAPPERS.

NEWSPAPER WRAPPERS. Mara's Patent Self Sealing and Folding Water-lined Newspaper Wrappers. Manufactured only by

JOHN Q PREBLE,
Envelope Manufacturer,
No. 77 White st, near Broadway, N. Y
And sold by all booksellers in the United State

Great Improvement

IN

Sewing Machines.

EMPIRE

SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $65
No. 2 Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No. 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

OSBORN'S

CELEBRATED PREPARED

JAVA COFFEE,

WARRANTED

Superior to any in the Market.

It is used by first-class families everywhere and highly recommended for nervous and dyspeptic persons, being very nutritious and free from all deleterious substances, in testimony of which I have certificates from the most eminent Physicians and Chemists in this Country. Try it, and you will be sure to continue its use in preference to any other.

☞ A liberal discount to the trade.

Put up only by
LEWIS A. OSBORN,
Wholesale Depot, 69 Warren st., New York

FOR SALE
ON MODERATE TERMS.

4 Cast-iron round Purifiers, 4 feet 6 inches diamater, cast in one piece,—also grating and covers complete.

1. 4 inch Centre Seal.
1. 4 inch Condenser.
1. 12 inches by 9 feet Washer.
1. 30 inch Station Metre.

The above have been in use for some time, but are in good condition, and are now offered for sale through want of use.

For particulars apply to
P. MUNSINGER,
GAS ENGINEER.
151 South 5th Street, Philadelphia.

SCIENTIFIC
MEDICAL PREPARATIONS
Of Prof. M. W. DICKESON, M D.,
Late Professor in the Philadelphia Med. College.

Peristaltic Persuaders.
A VEGETABLE STOMACH AND LIVER PILL.

Purely vegetable pills, prepared for the various geological formations, to neutralize all miasmatic, mineral, or other influences upon the system, and without drastic effect, which should be avoided. The best and most reliable family medicine extant, harmless under any system of diet, or exposure, acting mildly and surely, and leaving the stomach and bowels in a natural and healthy condition. To dyspeptics they are invaluable. Price 25 cents.

Imperial Cough Pills.

If you suffer from a cough it is your own fault. A trial of these pills will convince you of that fact. They decompose the phlegm, and subdue all inflammation. It is the best compound ever put together for colds, coughs, asthma, spitting of blood, and consumption. All afflicted with coughs, from whatever cause—even children with worms—can be cured by their use. Price 50 cents.

Anti-Cholera Pills.

A positive cure for any case of cholera. No matter how virulent may be the attack; also, Diarrhea or Dysentery—a sure and speedy cure. Sufferers from Chronic Diarrhea should try this established result of science. Price 50 cents.

MAGNA.
A LINIMENT CURING ALL INFLAMMATIONS.

The most extraordinary liniment ever produced or elaborated by science or experience for neuralgia, white swelling, swelling of the joints, neck, breast, arms, or elsewhere; lumbago, sore throat, erysipelas, gout, inflammation of all kinds, nervous affections, ulcers of every character; diseases of the skin, such as tetter, ring-worm, itch, &c. &c.; bites of venomous animals, stings of reptiles and insects, flesh wounds, external poisons, also burns and scalds. Price 50 cents.

MIASCETUM.
A PURIFIER AND TONIC BITTERS COMBINED,
WITHOUT ALCOHOL.

The Miascetum acts upon the stomach in such a manner as conclusively to neutralize the effects of miasmatic, malarious, and all other impure or deleterious atmospheric influences upon health. It unerringly removes the morbid condition of the stomach, imparts renewed vigor to every function of the human system, is a sure preventive of fever and ague, and all other biliary derangements, and a reliable protection against the diseases of tropical climates. Price 75 cents. N. B.—Preventive of all maligaant fevers, particularly the spotted.

HUILE D'OR.
(OIL OF GOLD.)

The Huile d'Or is the product of the most careful analysis and anatomy of the hair, it will remove and prevent all diseases of the scalp, strengthen the roots and increase the growth of the hair, beautifying and deepening its color; give vigor to the natural supply of coloring matter that gives tint to the hair; and, in short, can have no superior for aiding nature in giving flexibility, beauty, and strength to the prime ornament of the person.

PRICE, ONE DOLLAR PER BOTTLE.
Sold by Dealers and Druggists generally.
Principal Depot, No. 91 Liberty St., N Y.
SMITH & Co.

ANALYTICAL CHEMIST
C. ELTON BUCK,
Analytical and Consulting CHEMIST,
39 NASSAU STREET, NEW YORK,

Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works,
417 Walnut st., Philadelphia.

DON'T FAIL TO READ THIS!

COFFEE

COFFEE! COFFEE!

EAST INDIA COFFEE CO.

154 Reade St.,

(Three doors from Greenwich St.) NEW YORK,

Call universal attention to their

Kent's East India Coffee!

KENT'S EAST INDIA COFFEE

Has all the flavor of OLD GOVERNMENT JAVA, and is but half the price; and also that

KENT'S EAST INDIA COFFEE

has twice the strength of Java, or any other Coffee whatever and wherever used by our first-class hotels and steamboats—the stewards say there is a saving of 50 per cent.

KENT'S EAST INDIA COFFEE

is the most healthy beverage known, and is very nutritious. The weak and infirm may use it at all times with impunity. The wife of the Rev. W. Eaves, local minister of the M. E. Church, Jersey City, who has not been able to use any coffee for fifteen years, can use

KENT'S EAST INDIA COFFEE

three times a day without injury, it being entirely free from those properties that produce a nervous excitement.

Dr. JAMES BOYLE, of 156 CHAMBERS ST., says: "I have never known any Coffee so healthful, nutritious, and free from all injurious qualities as

KENT'S EAST INDIA COFFEE

I advise my patients to drink it universally, even those to whom I have hitherto prohibited the use of Coffee.

The PRINCIPAL OF THE NEW YORK EYE INFIRMARY says: "I direct all the patients of our Institution to use, exclusively,

KENT'S EAST INDIA COFFEE,

and would not be without it on any account.

The Rev. C. LARUE, an eminent clergyman of the M. E. Church, now stationed at Halsey street, Newark, says of

KENT'S EAST INDIA COFFEE,

"I have used it nearly a year in my family, and find it produces no ache of the head or nervous irritation, as in the case of all other Coffees. It is exceedingly pleasant, and I cordially recommend it to all clergymen and their families."

KENT'S EAST INDIA COFFEE

is used daily by the families of Bishop Ames, Bishop Baker, Bishop James, and many of the most distinguished clergymen and professional men in the country."

Beware of Counterfeits!

and be sure that packages are labeled

KENT'S EAST INDIA COFFEE,

154 Reade Street, New York,

as there are numerous counterfeits afloat under the name of "Genuine East India Coffee," "Original East India Coffee," etc., put forth by imposters to deceive the unwary.

In 1 lb. packages, and in boxes of 35, 50, and 100 lbs., for Grocers and large Consumers. Sold by Grocers *generally*.

Orders from Country Grocers solicited, to whom a very liberal discount will be made.

Wholesale Agents: Hoeflish & Molan, and W. J. Heiss & Bro., Philadelphia; Francis H. Perry, Providence; A. L. Waite & Co., Boston; Pynchon & Lee, Springfield, Mass.; S. N. Callender, Buffalo; Gordon McMillan & Co., Cleveland; A. A. Colter & Co., Cincinnati; J. & J. W. Bunn, Springfield, Ill.; H. B Shields, Corydon. Ind.; and C. C. Garber, Chicago.

The Am. Adv. Agency, 308 Broadway, N. Y., will receive orders for the above named Coffee.

Business Dep., E. ALVORD. | *Corresp. Dep.*, FOWLER & WELLS.

"MAY THE BEST MAN WIN."

SAVE YOUR MONEY!

The Cheapest, most Delicious and Healthy Coffee in the World!!

LEIBIG'S ESSENTIAL COFFEE

The most Healthy,
The most Economical,
The most delicious

PREPARATION OF COFFEE

IN THE WORLD,

OLD OR NEW.

This Coffee is prepared under a formula from the great German chemist,

PROFESSOR LEIBIG,

and gives the essential full strength and delicious flavor of OLD GOVERNMENT JAVA COFFEE, which is the only quality of Coffee used in its preparation, without any of that narcotic quality which so sadly damages the nervous system in the use of even the best grades of Coffee as ordinarily prepared.

2d. It gives the essential tonic and diuretic elements of Dandelion, without the "hereby," coarse taste so disgusting, and yet always found in the ordinary Dandelion Coffee.

It is known to all acquainted with chemistry, that the essence, or oil, or whatever name may be given it, when properly and scientifically obtained from any herb or plant, is a far different article from that produced by putting that plant into water and boiling it out—permitting the escape of the most exquisite and reliable strength and leaving the coarse and earthy drugs precipitated or in solution.

So this preparation combines the exquisite aroma of the Java Coffee, with the highest essential excellence of the most choice Dandelion—yielding the spirit without the grosser earthy body of both; thereby avoiding the deleterious effects of both and becoming at the same time

The most Delicious Beverage

AND THE

Most Health-giving and Restoring Drink

Known in the world—being at once a sovereign remedy instead of producer of

Dyspepsia and General Nervous Debility,
Flatulence, Fulness of the Head,
Dizziness, Costiveness, and
diseases of the Liver
and Kidneys,

because of its great Tonic and Diuretic qualities.

The simple fact that the preparation is from Baron Leibig, will commend it to the attention of the scientific in all parts of the country, while the use of it will at once and permanently prove to the masses everywhere that it is the long-needed desideratum—in its way.

The immense popularity of this Coffee in the Old World is an earnest that its use and popularity in America is bound to become continent wide.

Another consideration not to be overlooked in regard to the matter, is that

It Costs Less than Ordinary Green Coffee.

And requires less than half the quantity to give the same degree of strength, and its use proves it at 30 cents a pound to be cheaper than Maricaibo coffee at 15 cents a pound.

Neatly packed in pound papers, with full instructions for use on each label—in SIXTY POUND BOXES. Price, 30 cents per pound. A liberal discount to the trade.

Manufactured by the PEOPLE'S PROVISION CO., 268 Greenwich street, N. Y., to whom all orders may be addressed.

Sold by wholesale Grocers and Druggists.

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Covington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Gas-Light and Coke Co.; to the Gas Companies of Covington, Ky.; Dayton, Springfield, Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y, to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be hereafter, and not evaporating, greatly increases the economy of its use.

OFFICE OF THE COVINGTON GAS-LIGHT CO,
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as low as 14° below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto unavoidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in material and the large amount we make, are enabled to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
CINCINNATI, O.

The most Useful Invention of the Age!
PATENT
COSMOPOLITAN FURNITURE PASTE!
FOR POLISHING AND RESTORING
Furniture, Pianos, Marbles, Carriages,
&c., &c.,
SUPERIOR TO VARNISH.

☞ *DRIES INSTANTANEOUSLY.* ☜

It brings out the grain of the wood in all its original beauty, and immediately after being applied, the article polished is perfectly dry, thus possessing a very great advantage over varnish or any kind of liquid polish.

It will keep in any climate, and is always ready for use.

ONE BOX IS SUFFICIENT TO RESTORE AN ENTIRE HOUSE OF FURNITURE.

Price 75 Cents per Box. . Double size $1.25.

Each package bears our trade mark.

A LIBERAL DISCOUNT TO DEALERS.

For sale Wholesale by

H. B. HERTS BROS.,
52 JOHN ST., N. Y.

BY ROYAL LETTERS PATENT.

HERT'S & CO'S
AMALGAMATED
ALUMINUM, ZINC AND PLATINA
PENS.
WARRANTED ANTI-CORROSIVE.

In introducing this invention, Messrs. HERTS & Co. beg to call attention to the following advantages combined in these Pens:

They possess the Anti-corrosive properties of the Gold Pen.

The Freedom of the Quill, and

The Flexibility of the Steel Pen.

Thus *combining* in *themselves* every advantage found in other pens; and by their anti-corrosive properties entirely obviating all the objections hitherto existing against the use of Metallic Pens.

Another advantage peculiar to these Pens, is that they *improve* after being a *short time in use*, and may be left in the ink without fear of injury, as they *never need wiping*.

THE No. 808 "medium points," are adapted for *office use* and *general business purposes*.

THE No. 909 "extra fine points," are adapted for *Ledger, Heading, Posting, Engrossing, Ladies and School use*.

The undersigned have given HERTS & Co's Pens a trial, and are satisfied to recommend them to the general public.

FOWLER & WELLS.

Manufactory, Bradford Works, Birmingham,
ENGLAND.

Orders for the United States, Canada, South America, and the West Indies, must be addressed to

H. B. HERTS, 52 John St., New York,
SOLE CONSIGNEE.

from whom samples may be obtained *gratis*, on application by mail or personally.

The Am. Advg. Agency, 389 Broadway, N. Y., will receive orders for the above-named Pens.

New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public. And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co., Sole Proprietors.
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitterz, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy to keep in the house.—*New York Weekly Day Book.*

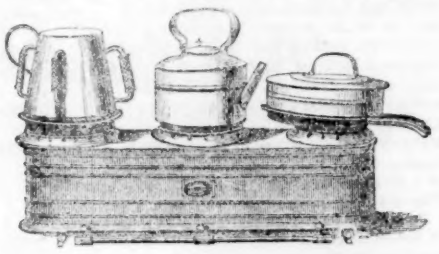
YONKERS, May 9th, 1864.

MESSRS. GEO. C. HUBBEL & Co.:

GENTS,—Having used only two bottles of your "Golden Bitters," can recommend them with the utmost confidence as a Tonic, and particularly for a change of diet and water. It is as well for ladies and children, giving them part of a wine glass two or three times a day. Yours respectfully,

GEORGE C. BARKER.

EAGLE GAS STOVE WORKS.



Cooking & Heating
BY GAS.

No Smoke! No Dirt No Smell!

The "EAGLE" Gas Stoves

Will BOIL, BROIL, ROAST, BAKE, TOAST,

STEW, and HEAT IRONS

☞ CHEAPER
THAN COAL OR WOOD.

I have on hand and make to order STOVES and FURNACES for CHEMISTS, TINNERS, BOOK-BINDERS, DENTISTS, TEA STORES, VULCANIZING STOVES, PHOTOGRAPHERS' OVENS, &c., and for TAILORS' and LAUNDRY-IRONS.

Send for Descriptive Catalogue.

I ALSO MANUFACTURE

COAL OIL STOVES,

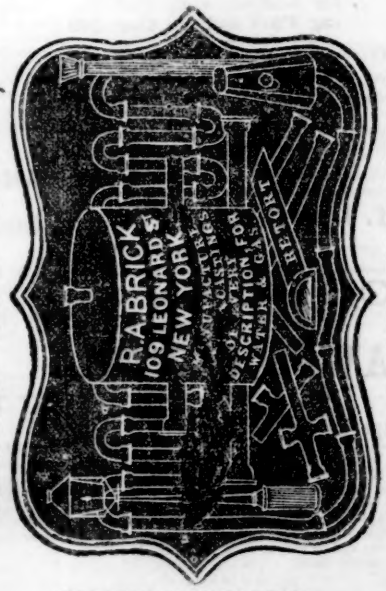
For Cooking and Heating.

H. D. BLAKE, *Sole Manufacturer*

No. 474 BROADWAY, N. Y

PIPES AND CASTINGS,

BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

OF EVERY DESCRIPTION.